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Analyzing the Possibilities of Implementation of AI and Social Networks in Teaching Foreign Language Students: Ukrainian Universities Case Study

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Abstract
The growing integration of artificial intelligence (AI) and social networks into the educational landscape has raised questions about their impact on teaching and learning, particularly in foreign language instruction. This study explores the didactic properties of social networks and AI as information and communication technology (ICT) tools in the context of foreign language education at the university level. Through a comprehensive literature review, the researchers analyzed global studies on the integration of AI and social networks in language learning, as well as research specific to the Ukrainian higher education context. A SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis was conducted to systematically evaluate the potential benefits and challenges associated with the implementation of these technologies in foreign language instruction. The findings indicate that using AI-driven language learning applications, and social media platforms can significantly enhance vocabulary retention, language proficiency, and student engagement. However, the study also highlights potential threats, such as risks to academic integrity, entrenchment of discrimination, and the democratization of plagiarism. The research further emphasizes the importance of addressing teachers' skills in navigating the ethical implications of AI integration in educational settings. The study provides valuable insights for university administrators, language instructors, and educational technology researchers. It underscores the need for a nuanced and informed approach to incorporating AI and social networks into foreign language curricula, balancing the pedagogical benefits with appropriate safeguards to ensure the quality and integrity of the educational process. The findings contribute to the evolving discourse on the role of emerging technologies in transforming higher education and language teaching.
Keywords: Artificial intelligence, didactic properties, foreign language education, information and communication technology, social networks, Ukrainian universities

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Introduction

It is necessary to create comfortable conditions to ensure the organization of educational activities, by creating an informational and communicational educational environment to update knowledge and technology as a tool for improvement of the quality of the educational process. The main components of this environment were the achievement of the quality of education, which dictates the constantly updated standards of education of the new generation and the didactic capabilities of information and communication technologies (ICT) and Web technologies:

> "… this technology can serve not for individual purposes only, but also group tasks. But in both cases, it is essential to take into account the personality traits of each student within his psychological aspect, which include student's interest in the process of learning, the degree of confidence in his capabilities, cultural characteristics, motivation to learn a foreign language, willingness to make one's own decisions" (Babelyuk et al, 2020, p. 9).

Thus, the above determines the relevance of the study and allows us to formulate its problem: to attract more attention to the study of foreign languages in work, the educator needs to use information technologies that stimulate the motivation of students, add variety to the educational process, exclude monotony in the classroom, and activate the cognitive activity of students and prepare them for a comfortable life in the modern information society.

The object of the research is the process of teaching foreign languages in a language university. The research subject is artificial intelligence (AI), social networks, and their didactic properties as a means of information and communication technology in the educational environment when teaching foreign languages at a language university. The research aims to study the didactic properties of social networks as a means of ICT in teaching foreign languages in a language university.

Based on the set object, subject, and objective of the study, the following range of tasks can be defined: to analyze and characterize the types and specifics of modern technologies for teaching foreign languages; to determine the role of the Internet as a means of information and communication technology in teaching foreign languages; to characterize and consider the didactic possibilities of AI and social networks in teaching foreign languages; to conduct experimental training to test the effectiveness of the introduction of AI intelligence and social networks as a means of interaction between students and teachers in the process of learning a foreign language at a language university.

Literature Review

Numerous global studies have explored the integration of AI and social networks in language education. For instance, Crompton and Burke's research (2023) demonstrated the effectiveness of AI-driven language learning applications in improving students' vocabulary retention and overall language proficiency. Their study, conducted in diverse educational settings, highlighted AI tools' adaptability and personalized learning features.

Research specific to the Ukrainian higher education context includes the work of Kovachov (2023), who investigated the current state of AI integration in Ukrainian universities. Their study examined the challenges and opportunities of incorporating AI tools into teaching and learning processes. Insights from this research shed light on the readiness of Ukrainian institutions to adopt AI in education.

Studies such as the one conducted by Barnes (2013) explored the role of social networks in language learning, specifically focusing on their impact on student engagement and interaction. The researchers conducted surveys and interviews to analyze how platforms like Facebook and Twitter were utilized to create collaborative language learning communities, providing valuable insights into the potential benefits and challenges of social networks in language education, the change of fundamental structures in university society, and the formation of a new research agenda in higher education (Bearman et al., 2022); increasing efficiency in educational (teaching and learning processes) and research activities and development of new skills (Pisica et al., 2023; Bearman et al., 2022; Times Higher Education, 2023; Chu et al., 2022); the change in accountability at all levels of the educational and research process (Bearman et al., 2023); high prediction quality with many input variables and recommendations based on student characteristics, improving student academic performance and improving online processes (Ouyang et al., 2022; Salas-Pilco & Yang, 2022).

Threats regarding the use of AI in higher education include misunderstanding of the context, threat to academic integrity, entrenchment of discrimination in education, the democratization of plagiarism, and the decline of high-level cognitive skills (Farrokhnia et al., 2023), replacing the authority of teaching staff and administrators (Popenici & Kerr, 2017),lack of skills of teachers to solve ethical issues application of AI in an educational context (Holmes et al., 2022).

Methods

In the course of the study, a complex of general scientific research methods were used: theoretical and comparative analysis for analysis of official materials and analytical reports on the policy of using AI in general and in higher education in particular; scientific work of foreign and native scholars on the implementation of AI in higher education. When conducting a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis of application problems connected with AI in higher education, methods of systematization, generalization, and interpretation of the obtained results were used. The statistical method made it possible to find quantitative indicators regarding the opportunities and threats of using AI in higher education institutions.

Results

The year 2002 marked the onset of the digitization era, sparking numerous inquiries about navigating the digital transition with considerations for security, sovereignty, and quality of life. Key questions emerged regarding the potential outcomes of this shift, the societal changes it might bring about, and the impact on humanity. Assessing digital transformation prospects became a pivotal task alongside implementing the digital transition strategy. Contemplating the future of translation in this context is inevitable.

Over the centuries, information carriers evolved from stone and clay tablets to wax tablets, papyrus, parchment, paper, and then to diskettes, CDs, and flash drives, culminating in cloud storage that surpasses classical libraries in volume and speed of information storage. In the 21st century, the Internet, enabling network interaction among computers and remote information transmission, significantly boosted this evolution. The modern digital format's properties, such as lossless copying, increased recording density, transmission speed, and expansive replication capabilities, mark a milestone in the technological trends shaping the history of AI in education.

The advantages of incorporating Information and Communication Technology (ICT) in teaching FLS are evident in resource savings, notably time. Editing, making changes, and copying a text require significantly less time than they did three to four decades ago. Furthermore, the need for bulky material carriers has diminished, as learning individual processes necessitates today are only a personal computer, software, and an internet connection – all virtual tools with resource limitations. Additionally, programs exhibit adaptability and flexibility, allowing learners to optimize their workspace, characteristics, and properties for maximum comfort and efficiency.

It is necessary to consider the influence of artificial intelligence and social networks from both positive and negative sides of their implementation in educational process. It is known that the benefits of using artificial intelligence and social networks are endless, so we want to consider the most famous of them:

1. It is known that today there is the possibility of remote/online work, which undoubtedly simplifies a person's financial support process. This is a great opportunity for people who, for some reason, cannot work directly in the office or at the plant/site (creating content, writing texts for publications, editing photo and video materials, promoting your own business (advertising), etc.).

2. There was an opportunity for distance education for people with disabilities, with limited resources, mothers on maternity leave, people living in remote regions, and other people who, for certain reasons, cannot study full-time. It should also be noted that artificial intelligence and social network programs are assistants in education when full-time education is not possible. For example, in the situation with the spread of COVID-19 and military operations, war, programs of artificial intelligence and social networks are one of the most important tools for implementing distance education around the world. Next, we will take a closer look at the didactic possibilities of using artificial intelligence and social networks in the process of learning acquisition in particular.

3. Undoubtedly, the use of AI and social networks are an excellent tool for a person's self-development. With their help one can learn foreign languages (dictionaries, electronic textbooks, audio and video materials), improve your skills and take courses (on psychology, pedagogy, beauty industry, driving, cooking, and much more), get a lot of new information, etc.

4. The fundamental goal of the use of AI and social networks in educational systems should be the maximum individualization of education, offering students personalized learning trajectories according to their strengths and weaknesses and didactic material adapted to their characteristics while preserving the quality of education and the integrative principle of educational systems.

After analyzing all of the above, it should be noted that the list of advantages of day implementing AI and social networks are huge and updated daily. It can also be concluded that AI and social networks have now firmly entered our lives. But this has its hazards, which we consider it necessary to mention in our work: 1) Harm to health. A modern person spends a lot of time on computers, laptops, phones, and tablets, since, as we indicated above, both study and work. This can cause some harm to the physical health of a person (physical inactivity, decreased vision, changes in hormonal levels, stress on the nervous system, and much more); 2) The likelihood of dependence. As mentioned above, a modern person spends a huge amount of time using ICT,

which negatively affects his psychological state. As you know, children and adolescents have an unstable psyche, therefore, they are more susceptible to outside influence, in particular the Internet. Often, children and teenagers do not see the line between reality and the virtual world, they stop monitoring the time spent on the Internet, and the Internet replaces parents and friends. All this leads to Internet addiction —a psychological disorder that can cause various complexes, for example, an inferiority complex. To avoid this, it is necessary to monitor how much time is spent and the reaction to the ban on using the Internet for a while; 3) Personal Data loss. Possibility of access to personal data by third parties. Since users archive personal data using the Internet, there is a threat of their leakage to third parties. Every day there are more and more ways to hack email passwords, websites, personal pages on social networks, etc.; 4). Tool for disinformation (the use of unreliable texts, photos, videos) which can lead to the impossibility of a person establishing accurate information; 5) The impact on the labor market, the loss of jobs for people due to the lack of need for professions that require performance, in particular technical tasks (translators, assistants, etc.); 6) Establishing a threat to humanity, using huge volumes of data that can develop unexpected behavior (Metz, 2023).

Discussion

Broad opportunities and prospects for the use of AI in education are traced to transform the educational process into a more innovative, inclusive, efficient and effective one by introducing new high-quality teaching methods that are fast, personalized and student-centered.

Significant changes in the use of AI in the field of higher education, in particular in educational and research activities, in today's conditions are taking place in the following key areas (Crompton & Burke, 2023; Ouyang et al., 2022): 1) assessment (in particular, automatic assessment and assessment of educational progress and student attitudes to learning, individual and group assessment, etc.); 2) forecasting of study status (prediction of student dropout, risk groups, innovative abilities, career decisions), productivity or satisfaction, improvement of educational experience; 3) assistance (supporting students in obtaining an education, for example, an anthropomorphic presence, which includes virtual agents and persuasive intervention through digital programs); 4) tutoring (individual strategies and approaches to the characteristics and needs of students); 5) training management (training analytics, sequence of educational plans and programs, development of instructions and distribution of students).

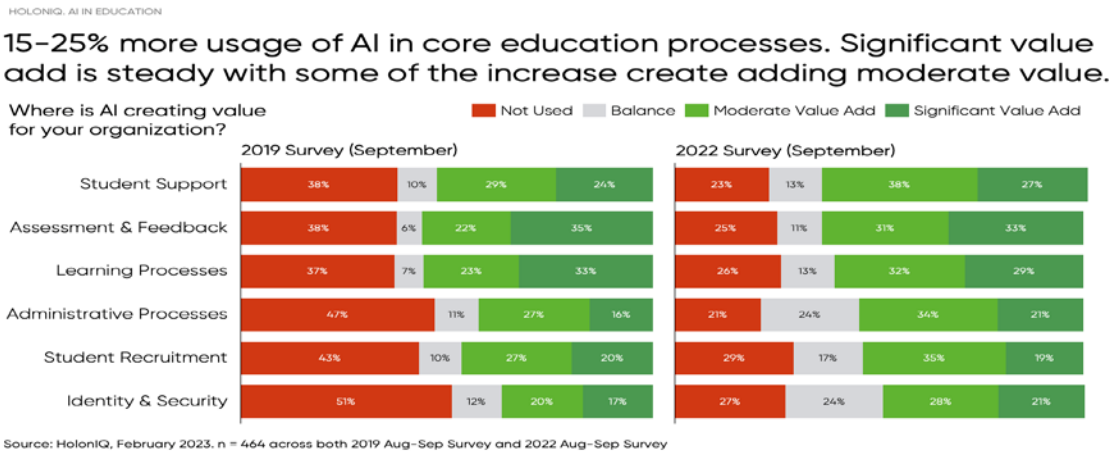

Figure 1. AI in core educational process (HolonIQ)

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As the survey shows, the usage of AI in the core educational process has been increasing steadily in recent years, and it can be supposed that 2023 will continue adding in all spheres of the educational process. As to learner outcomes, they remain and add to be the top reasons for adopting AI in educational process (2019-2022) that include improved learner outcomes (+8%), cost savings due to automation (+12%), improved agility (+13%).

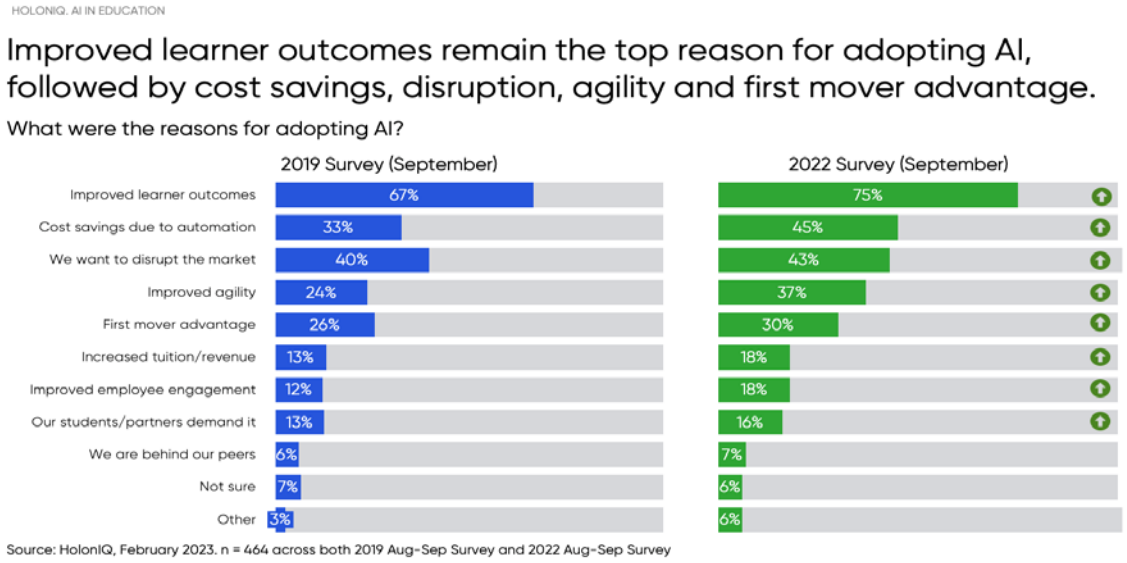

Figure 2. Improved learner outcomes 2019-2022 using AI in educational process

As the survey showed, the most popular social networks are Facebook, YouTube, Instagram, and TikTok. It is necessary to find out why they are most in demand among students.

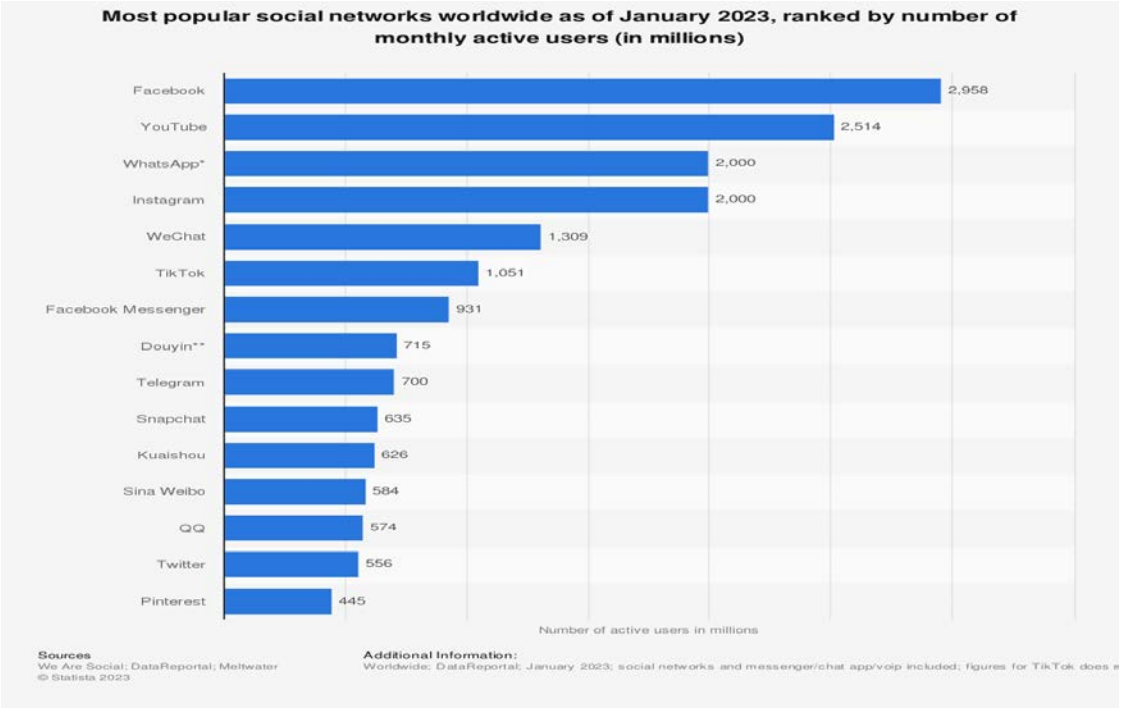

Figure 3. Most popular networks worldwide

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1. Instagram (Instagram) is an application with elements of a social network for sharing photos and videos that allows you to take picture and video content, apply "filters" to them and edit them. The development of the Instagram application began in San Francisco. The application appeared in the Apple App Store in 2010. For 2022, the number of registered users is 2,3 billion people. 21,1 % of all people aged 13 and above around the world use Instagram today. Instagram ranks fourth among the most popular social networks in the world.

Currently, Instagram has several types of pages: personal user accounts, bloggers, public (thematic communities), online stores, business accounts (cafes and restaurants, travel agencies, production), brand accounts, etc. This application has become popular not only among young people but also among middle-aged and older people. The reason is that Instagram is one of the most convenient platforms where users can share not only photos but also important information (accounts of psychologists, doctors, teachers, etc.).

Research data shows that the respondents use AI and social networks not only for communication and entertainment but also for study. Thus, in the research, it is necessary to consider the didactic possibilities of AI and social networks.

Under the didactic capabilities of a particular means of education, one should understand the natural, technical, and technological qualities of the object, those of its sides, and aspects that can be used for didactic purposes in the educational process.

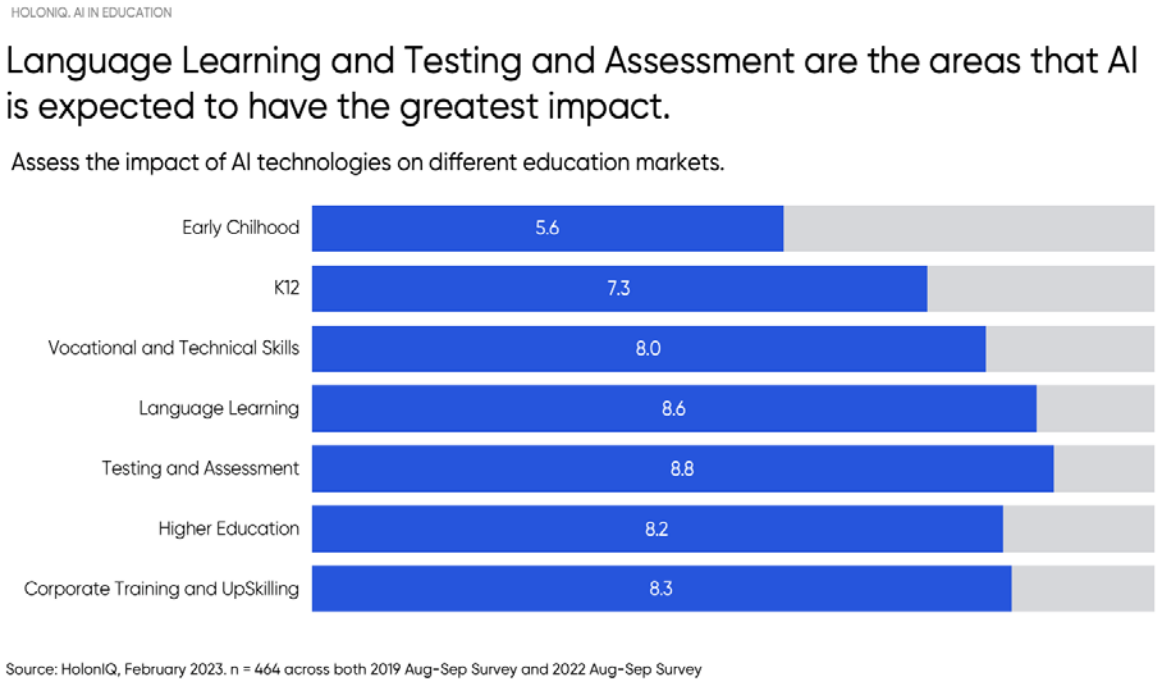

Figure 4. The areas that AI is expected to have the greatest impact

Based on the results of the survey, it can be concluded that learning with the use of AI and social networks is a process where students will feel comfortable, where students can relax, devote time to their interests. The most efficient spheres of the use of AI are Testing and Assessment (8,8), Language Learning (8,6), and Higher Education (8,2).

Now, based on the statistics of the use of AI and social networks in the educational process by Ukrainian teachers, it should be considered the didactic possibilities of social networks in teaching foreign languages for further use of these data by colleagues in their work.

1) Multimedia. As mentioned earlier, AI and social networks can generate and post information in various formats: text, graphics, audio, video, and images. It is known that visual material contributes to a better memorization of the material covered, activates the cognitive activity of students, and helps to create an atmosphere in the classroom that is as close as possible to the real language environment.

2) The ability to create a personal profile of the student. In social networks and programmes of AI, users have the opportunity to create personal profiles where they can generate and post any kind of information about themselves: tell about themselves through profiles, messages, posts, photos, and videos. Thanks to the personal profiles of students and the information that is there, teachers can analyze the interests of students, which can favorably affect the content of the material that teachers are going to present to students, it is also a good helper in timely prevention of students' depression (for example, suicidal groups, music, etc.).

3) Simultaneous communication of all chat participants. In some social networks and AI programs, it is possible to create chats and communicate with all participants in this chat at the same time. This function is very convenient in the educational process since the teacher can observe all the students and their work and correct the mistakes of each chat participant. Of course, it is easier to carry out project activities through group chats, which is undoubtedly an advantage of using this social network and AI in the educational process.

4) Communication with native speakers. To improve their knowledge of the language being studied, students can communicate with native speakers in various forums or communicate with artificial intelligence voice generators, selecting different variants of the same language and even accents. The advantage of this type of interaction lies not only in the development of sociocultural and intercultural competence but also in expanding the horizons of students. Students can participate in various discussions, thereby improving their written speech in a foreign language, learning to defend their points of view, and sharing experiences with interlocutors. Of course, the list of didactic possibilities of AI and social networks is much longer, but we have considered the most famous ones. The survey shows that one of the most popular AI programme is Chat GPT and a social network among youth of Ukraine is Instagram.

Findings

The didactic potential of AI, mainly Chat GPT and the social network Instagram, in the educational process has not been disclosed. The experimental verification of the developed practices took place in 2022-2023 based on Vinnytsia Institute of Trade and Economics of Kyiv National University of Trade and Economics, Drohobych Ivan Franko State Pedagogical University, Odesa Maritime University, at the Faculty of Foreign Languages on a group of students studying English as a foreign language, including 86 with an Intermediate - Upper Intermediate level of English. This experimental group was chosen based on the fact that the predominant number of social network and AI users are young people, and the level of motivation to learn a

foreign language at a language university is high. As mentioned above, in the process of conducting the survey, we found that each respondent uses AI and social networks, and one of the main purposes of using AI and social networks for students is to study. Thus, when designing this experiment, both factors were taken into account.

The possibilities of AI implementation, primarily ChatGPT are most evident in teaching and learning processes during: generation of alternative ways of expressing an idea; opposition (additional argumentation) in discussions; study and problem-solving (coaching); creating content for classes (for example, defining discussion questions); student support and personalized real-time feedback based on information from students and teachers; improvement educational plans and programs; study and interpretation of data; dynamic assessment of academic achievements, etc.; as a separate tool or integrated into other systems and platforms used in higher education institutions; self-improvement, expanding access to information, promoting personalized and comprehensive training; reducing the load on teachers, which will contribute to the productivity of the implementation of key processes and tasks.

Preliminary experimental training included studying the need to introduce Chat GPT and the Instagram social network into the educational process, motivating students to work with these apps, analyzing the material covered by students during the semester, their level of foreign language proficiency, and talking with the teacher. Based on the curriculum and materials that were studied by students during the semester, students were given ten days to complete some tasks. It should be noted that this activity was carried out in groups (3-4 people per group). At the same time, some types of exercises were performed by each student individually, which served as the basis for further evaluation of the quality of the performance of this activity by each student.

As mentioned earlier, the tasks of the proposed format included both individual and group forms of work. The individual form of work provided for the student to complete his task, for example, compiling a "post" — someone's message, comment, or any other information prepared using Chat GPT and posted for public reading on any forum, page on a social network, or blog. This task format provides the teacher with the opportunity to check the quality of the acquired lexical material for a certain period by each student, grammatical material, and writing skills. The group form of work was to create "blogs" using AI and social network Instagram. Thanks to this format of work, the teacher can assess the ability of students to communicate with each other using remote communication technology, work in a group, and independently distribute responsibilities within the group.

It should be noted that this type of task is directly related to the project technology. During the experiment, a set of exercises developed helped to solve some problems: to develop personal skills; to navigate the information space independently; to build their knowledge and to solve various kinds of problems independently; to analyze the information received; to develop the creative abilities of students.

This format of work can provide great opportunities for expanding the educational framework, which, of course, involves increasing the motivation of students and contributes to the individualization of learning. During the experiment, project activities allowed students to act as authors, designers and increase their creative potential.

At the end of the experiment, the students were asked to take a survey, which later helped us to determine what difficulties, if any, the students encountered in the process of work, and what positive aspects the students noted in the work format which was proposed.

Among the benefits the students mostly noted collective work, the ability to implement ideas, which are difficult to implement in the traditional educational process, the possibility to invent posts, topics of posts, and format; the ability to express your creativity, the possibility of improving written speech in a foreign language and its further adjustment by the teacher.

Interestingly, the majority of students did not have any difficulties with the implementation of the exercises developed. This may indicate that most of the functions of AI and social networks are known to students, so their implementation into the educational process can go without any problems.

Conclusion

The number of AI programmers and social networks is growing every year. It should be noted that the use of AI and social networks has both advantages and disadvantages. Today, thanks to AI and social networks, users can carry out educational activities, work, communicate with other users from anywhere in the world 24/7, improve the necessary skills in various fields, and much more. But also AI and social networks can negatively affect the health, psyche, and habitual rhythm of human life. Therefore, in this research work, we call for the rational use of AI and social networks in the life of every person.

Based on the data presented it can be concluded that programs of AI and the social network Instagram is mainly not used by teachers of foreign languages for educational purposes. Chat GPT and Instagram became the platforms for the experiment, as ones of the most popular today among Ukrainian youth. The survey also showed that 70% of students liked the work format that was proposed, and 80% of respondents wanted teachers to use this kind of task in their work. Therefore, we can conclude that the results of our research work can be useful for teachers not only of foreign languages but also of other disciplines since the educational process must comply with both state educational standards and the demands of society.

Comparing how Ukrainian and foreign teachers use AI and social networks in the educational process, we can conclude that in Ukraine AI and social networks are rarely used in education, unlike foreign experience. In this research we tried to unleash the didactic potential of AI and social networks and conduct an experimental test of the possibility of introducing the Chat GPT and Instagram social network into the educational process. The study showed that today it is possible to determine such didactic possibilities of AI and social networks as multilingualism, simultaneous communication of all chat participants, generation of authentic texts, multimedia, communication with native speakers, the possibility of video conferencing, and more. Experimental verification of the research and a subsequent survey of students participating in the experiment showed that the students approached the implementation of the tasks with responsibility and creativity.

During the experiment, it can be concluded that this format of work activates the cognitive activity of students, reveals their creative potential, and provides the teacher with the opportunity to combine in his work different forms of work and control the material that students have learned over a certain period. Also, the survey showed that students would like to see such tasks in the educational process, which, of course, allows us to conclude that it is possible to introduce AI programs and social networks into the educational process when teaching foreign languages at a language university. Due to the performed survey, considerable attention should be paid to the problems of AI implementation into the education process, including responsible use of AI in teaching and learning; open digital educational resources, remote technologies training, in

particular based on AI and social networks, improvement of training and advanced training of pedagogical personnel through the introduction of digital technologies with AI, and social network elements into the educational environment, prospects of using AI and social networks in education, and scientific research, social risks that may arise with the development of AI-based social network tools.

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References

Babelyuk et al. (2020). Using Distance EdTech for Remote Foreign Language Teaching During the COVID-19 Lockdown in Ukraine. *Arab World English Journal*: *Special Issue on English in Ukrainian Context.* 4 -15. DOI: https://dx.doi.org/10.24093/awej/elt3.1

Babelyuk et al., (2021). Psychological Difficulties during the Covid Lockdown: Video in Blended Digital Teaching Language, Literature, and Culture. *Arab World English Journal (AWEJ) Special Issue on Covid 19 Challenges* (1) 172-182. DOI: https://dx.doi.org/10.24093/awej/covid.13

Barnes, S. B. (2013). *Social networks: From text to video*. Peter Lang Inc., International Academic.

Bearman et al.,. (2022). Discourses of Artificial Intelligence in higher education: A critical literature review. *Higher Education*. https://doi.org/10.1007/s10734-022-00937-2

Chu et al., (2022). Roles and research trends of artificial intelligence in higher education: A systematic review of the top 50 most-cited articles. *Australasian Journal of Educational Technology*, *38*(3), 22-42. https://doi.org/10.14742/ajet.7526

Crompton, H., & Burke, D. (2023). Artificial Intelligence in higher education: The state of the field. *International Journal of Educational Technology in Higher Education*, *20*(1). https://doi.org/10.1186/ s41239-023-00392-8

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, *13*(1), 210–230.

Farrokhnia, M., Banihashem, S. K., Noroozi, O., & Wals, A. (2023). A SWOT analysis of CHATGPT: Implications for educational practice and Research. *Innovations in Education and Teaching International*, 1-15. https://doi.org/10.1080/14703297.2023.2195846

Hennig, M., Brandes, U., Pfeffer, J., & Mergel, I. (2012). *Studying social networks: A guide to empirical research* (1st ed.). Campus.

Holmes, W., Porayska-Pomsta, K., Holstein, K., Sutherland, E., Baker, T., Shum, S. B., Santos, O. C., Rodrigo, M. T., Cukurova, M., Bittencourt, I. I., & Koedinger, K. R. (2022). Ethics of AI in education: Towards a community-wide framework. *International Journal of Artificial Intelligence in Education*, *32*(3), 504-526. https://doi.org/10.1007/s40593-021-00239-1

Koliasa, O, Lelet, I.,Serebriakova, V.,& Yukhymets,S. The Use of Hypermedia Technologies in Higher Education Institutions during Covid Lockdown. *Arab World English Journal (AWEJ) Special Issue on Covid 19 Challenges* (1) 68-79. 2021. DOI:https://dx.doi.org/10.24093/awej/covid.5

Koskinen, J., Jones, P., Medeuov, D., Antonyuk, A., Puzyreva, K., & Basov, N. (2023). Analysing networks of networks. *Social Networks*, *74*, 102–117. https://doi.org/10.1016/j.socnet.2023.02.002

Kovachov, S., & Suchikova, Ya. (2023). Pohovory zi mnoiu: dialoh zi shtuchnym intelektom pro vykorystannia yoho v navchanni ta naukovykh doslidzhenniakh [Talk to me: A dialogue with artificial intelligence about its use in education and research]. *Scientific papers of Berdyansk State Pedagogical University. Series: Pedagogical sciences*, (1), 43-55. https://doi.org/10.31494/2412-9208- 2023-1-1-43-55 (in Ukrainian)

Metz, C. (2023). The Godfather of A.I.' Leaves Google and Warns of Danger Ahead. Available at: https:// www.nytimes.com/2023/05/01/technology/ai-google-chatbot-engineer-quits-hinton.html

Most popular social networks. Available at: https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/

Ouyang, F., Zheng, L., & Jiao, P. (2022). Artificial Intelligence in Online Higher Education: A systematic review of empirical research from 2011 to 2020. *Education and Information Technologies*, *27*(6), 7893-7925. https://doi.org/10.1007/s10639-022-10925-9

Pisica, A. I., Edu, T., Zaharia, R. M., & Zaharia, R. (2023). Implementing Artificial Intelligence in higher education: PROS and cons from the perspectives of Academics. *Societies, 13*(5), 118. https:// doi.org/10.3390/soc13050118

Popenici, S. A. D., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, *12* (1). DOI: https://doi.org/10.1186/s41039-017-0062-8

Reychav, I., Raban, D. R., & McHaney, R. (2018). Centrality measures and academic achievement in computerized classroom social networks: An empirical investigation. *Journal of Educational Computing Research*, *56*(4), 589–618. https://doi.org/10.1177/0735633117715749

Salas-Pilco, S. Z., & Yang, Y. (2022). Artificial intelligence applications in Latin American higher education: A systematic review. *International Journal of Educational Technology in Higher Education*, *19*(1). DOI: https://doi.org/10.1186/s41239-022-00326-w The Guardian. (2023, February 2).

ChatGPT reaches 100 million users two months after launch. https:// www.theguardian.com/technology/2023/feb/02/chatgpt-100-million-users-open-ai-fastest-growing-app

Times Higher Education. (2023). AI and the university. https://www.timeshighereducation.com/campus/ spotlight/ai-and-university