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PROMISING DIRECTIONS OF ARTIFICIAL INTELLIGENCE APPLICATION IN FOREIGN STUDENTS' LANGUAGE TRAINING

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In a state of a full-scale war, educational institutions in Ukraine were forced to switch to distance learning. This transformation of the educational space contributed to the rapid introduction of digital technologies, which are actively integrated into the educational process, and therefore have significantly changed the methodological approaches and techniques used to provide language training to foreign students at the initial stage of learning. For quite some time now, information and communication technologies have been part of the educational process, having improved and diversified to the point that in any Ukrainian higher education institution, preparatory departments and faculties have been using all available equipment (from a light projector to a multimedia board), software (from simple editors integrated into MS Office to multifunctional MLS like hot potatoes and Moodle), various Internet resources (e.g. virtual boards, live worksheets) and educational game platforms (like Kahoot!, Quizzes etc.) to ensure the basic principles of learning – systematicity, consistency and visualization – to increase its efficiency and effectiveness, as well as the students' motivation.

However, in the early 2020s, a new trend in the development of technologies took place, which was marked by the emergence and lightning-fast spread of Generative Artificial Intelligence (otherwise known as GenAI). This article focuses on its role in education and everyday life, during which the authors will try to prove the effectiveness, feasibility and advantages of using AI in language training for foreign citizens at the initial stage of learning. After all, although the use of artificial intelligence in the educational system is a relatively new direction, it has significant potential. To truly understand its capabilities, it is important to understand the essence of artificial intelligence and the principles of its operation, as well as to be capable of working with it. Accordingly, this article considers the key definitions of artificial intelligence and its philosophical interpretations. The areas of this advanced technology application are also to be discussed.

Particular attention is paid to promising aspects of using artificial intelligence in language education, in particular USL (Ukrainian as a Second Language) training, such as personalized and adaptive learning, knowledge assessment, intermediate testing, the use of gaming technologies (or gamification of the educational process), the development of other innovative approaches using programs and applications that are powered by artificial intelligence algorithms, significantly simplifying the learning process for both teachers and students.

Key words: artificial intelligence, automated assessment, chat-bot, educational space, gamification, generative AI, personalization.

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Introduction and Problem statement. Since the beginning of the full-scale Russian invasion, Ukraine has faced serious challenges in the field of education. Many students were

forced to leave their educational institutions, especially in regions close to the battlefield, and move to safer areas of the country or even abroad. Higher education institutions located in these areas have switched to distance learning. This working mode had been first introduced during the COVID-19 pandemic in 2020-2021, when educational institutions were made to adapt to quarantine restrictions. Concordantly, the education of foreign students in the front-line regions became available only in the remote mode, as well, and such a transition created many new challenges for teachers of preparatory faculties and departments in Kharkiv, Sumy, Zaporizhia, Dnipro and other Ukrainian cities, because the success of mastering Ukrainian as a Second language largely depends on immersion in the speaking environment, on the inevitable need to use a new language not only in the classroom, but also in everyday situations, communicating directly with native speakers. The impossibility of this in the conditions of distance learning, when a student continues to be in his native language environment, and therefore does not need to use a new language on everyday basis, led to a certain crisis, the result of which was low motivation of students, slow progress and lack of high-quality learning results. The crisis situation required introducing new methods of work in a virtual classroom, which would contribute to the improvement of digital skills among all participants of the educational process. This has also led to the need of creating and developing a digital educational space, including technologies related to artificial intelligence (AI).

Review of recent research. To understand the key opportunities and approaches to integrating artificial intelligence into the educational sphere, it is important to consider the theoretical foundations of this concept. In the professional environment, the term «artificial intelligence» is not very wide-spread, the more accurate expression «artificial cognitive system» being more common. There are four main approaches to defining artificial intelligence. The first of them are focused on the degree of similarity of a digital system with the human mind, which can be expressed in the phrases «think like a person» and «act like a person». That is, artificial intelligence is a set of hardware and software tools that perform functions similar to the work of the human brain. The other two approaches, on the contrary, focus on rational thinking and behavior of the cognitive AI system [8 : 34–35].

The issue of introducing AI into the educational process is addressed by the studies of many contemporary scientists and educators. In particular, A. Androschuk and O. Maluga [8] outline the main directions and trends in the use of artificial intelligence in education, I. Viznyuk, N. Buglai, L. Kutsak, A. Polishchuk [2] and a number of other researchers focus their attention on the potential of introducing methods and AI-based teaching techniques into the educational process. S. Tolochko, A. Godunova [7], I. Drach [3], etc. explore foreign experience of such implementation, referring to successful examples of AI use in education and science in the United States of America, Canada and the countries of the European Union. While R. Berdo, V. Rasyun, V. Velichko [1], and O. Panukhnyk [6] focus on the ethical aspects of using AI in education.

Highlighting previously unexplained parts of the issue, methodology. However, we have noticed the absence of thorough methodological studies on the application of AI-powered technologies in language training, in particular, when teaching Ukrainian as a second language, although the co-author of this article N. Opryshko makes an attempt to outline this issue in the published abstracts of reports at several local and international conferences [5]; [11]; [12]. Therefore, this study is rather a systematization of the work done in recent years on the implementation of AI technologies and apps that work on its algorithms in the educational space at the preparatory department of the Scientific

and Educational Institute of International Education in Cooperation at Kharkiv National Automobile and Highway University. Thus, the aim of this article is to consider the prospects for implementation of AI-based technologies in higher education institutions (HEIs) of Ukraine, in particular for training foreign citizens in the Ukrainian language. Reaching such an ambitious goal involves research on a number of objectives, among which the following can be distinguished:

1) to sketch a brief overview of the concept of «artificial intelligence» and the history of its rise;

2) to assess rapid development of technologies based on artificial intelligence in the 2020-s and their direct implementation in the form of Generative AI;

3) to outline methodological possibilities of using tools powered by the AI algorithms in foreign citizens' language training.

Findings and discussion. The question of the artificial intelligence nature gives rise to many philosophical interpretations, but most often AI, or artificial intelligence, is defined as «the ability of digital devices to perform those tasks that are characteristic of intelligent beings» [4 : 81]. Yet, this is not just another achievement of technological progress at the beginning of the 21st century. Back in the 1950s, Alan Turing proposed the idea that a system created by a person could be recognized as «intelligent» [15 : 440]. He developed an imitation test that allows you to assess whether a participant is able to determine whether they are communicating with a machine or a person. If differences are not detected, this indicates the presence of some form of intelligent system, i.e. artificial intelligence. In 1956, John McCarthy at a conference at Dartmouth University presented one of the first and most significant definitions of this phenomenon, describing it as «scientific and technical methods for creating intelligent machines» [10], but for many years the real implementation of such technologies was considered a matter of science-fiction. Until recently, when to realization of those old ideas at last became technologically plausible.

Currently researchers outline three main components that gave impetus to the development of artificial intelligence in the 10s-20s of the 21st century. First, this is a large amount of processed and prepared data (working with which had been problematic before), second, complex algorithms for artificial intelligence, which are currently in the final stages of development, third, the power and memory of computers, finally sufficient for the processing the former and operating the latter.

As for the potential for using AI in education, it is rather extensive: from improving inclusive education (serving students with special needs) to preparing young people for life in the world of artificial intelligence, and therefore – the formation of relevant knowledge, skills and abilities in students. An important element of such «learning for life» is the development of artificial intelligence algorithms that «could work in models of human teaching and learning» [9], which would not contradict the traditional education system, but could strengthen and improve it. Consequently, in the modern structure of education, communication with a human teacher, the use of the latest gadgets and multimedia technologies, book learning, practical classes, the use of robots/bots and virtual reality tools, with which you can model the learning environment, should interact. Since artificial intelligence is used in various fields nowadays, such as medicine, management, education, linguistics, psychology, etc, educators become more and more interested in gaming applications, machine translation with voice input, visual content recognition, cognitive computing, and computer creativity. Thus, artificial intelligence encompasses many aspects of teaching and learning.

Even at present, artificial intelligence plays an important role in education. Progress in this area is associated with the active development of new technologies that open up new prospects for optimizing the educational process, dramatically changing the structure of global higher education. In our opinion, promising areas of artificial intelligence application in the educational process of HEIs cover several aspects, such as: adaptive and personalized learning; automated knowledge assessment; intermediate testing and many others. Of certain interest there might be the interaction of educational process participants with various chat-bots, in particular with Chat Generative Pre-trained Transformer also known as ChatGPT. This chatbot was developed by OpenAI in 2022, and it almost immediately became very popular. Chat works on the architecture of the Generative Pretrained Transformer language model and can generate high-quality text similar to human speech. ChatGPT is trained on a very large amount of information available on the Internet, including websites, e-books, articles, news, etc allowing a high degree of personalization in any language training model.

Personalization of the educational with its help is achieved through the choice of different methods of organizing learning, which allows adapting educational content to the individual needs of students. The system can create an individual educational profile that meets the abilities of each student and will ensure their regular progress. Learning goals, approaches, relevant content and sequence of the material presented may vary depending on the needs of every singular applicant. Within the framework of adaptive learning, artificial intelligence is used to identify gaps in the knowledge of each student and adjust the selection of educational material in accordance with the results of the analysis. All these measures are aimed at improving the quality of learning and developing intellectual interaction at the cognitive, behavioral and physiological levels.

Along with such a serious tool for acquiring language knowledge, skills and abilities, a powerful potential for use belongs to a notion that every modern young person has been familiar with almost since early childhood: a video game. Gamification of the educational process is a long-known and effective method for improving work in the classroom, especially when it comes to intensive study of a foreign language at the initial stage of training (with more than 30 academic hours of the same language a week, usually with the same teacher). However, in this case, we are not talking about the use of gaming techniques as such, but about the use of chatbots operating on artificial intelligence algorithms which are, in fact, gaming applications for any mobile device, helping students expand their vocabulary, improve phonetic and grammatical skills, **as well as get the ability** to accurately articulate sentences in both oral and written form.

Up to this point, a relatively decent example of such a chatbot has been the web application *Character.ai*, which uses a neurolinguistic model to read a large amount of text and respond to prompts using this information. The principle of its operation is not complicated. The student can independently create a character (or avatar) on the website, fictional or based on a real person, customize its appearance, voice, tone and other characteristics, and also choose a suitable interlocutor. The latter is represented by the chatbot itself so that AI-powered character communicates with the student's avatar. There is also the opportunity to choose a scenario in which language practice will take place. Available options include friendly conversation, travel planning, preparation for a foreign language exam, writing a story, brainstorming ideas, a game, receiving book recommendations, assistance in making decisions and so on. In addition, you can select preferable language levels (from beginner, or zero level up to C1), choose between colloquial, standart or academic communication,

try different types of interaction with the bot, etc. The application adapts to user preferences, offering a wide range of plot settings and possible scenarios for the story development. Such a variety of choices means that learning a language would not be a task that needs to be done for your language class, but entertainment, a quest that could be completed, like in a video game, but also fully customized by the students themselves. The chatbot like that would give an opportunity to develop learners' communication skills (either oral or written), since the AI bot is able to exchange both text and voice messages. Unfortunately, this application does not yet have a Ukrainian interface, but its development could be a potential breakthrough in the language training of foreigners in Ukrainian HEIs not only at the initial stage of learning, but also at the next levels of higher education.

On the other hand, the use of AI technologies is designed to greatly facilitate the daily work of a teacher. Knowledge assessment systems based on artificial intelligence provide an objective measurement of learning outcomes, analyze performance and offer recommendations for its improvement, at the same time developing effective learning plans. They are also able to assess the degree of independence in completing tasks by analyzing video images and user activity in the browser. For example, everyone knows that intermediate testing is an important component of the educational process. In online learning, a good methodological approach is to use artificial intelligence in order to assess the assimilation of the material. Most often, online tests, which work on AI algorithms and provide instant feedback, are used for this. However, many of the opportunities that AI provides us can be utilised equally effectively by both students and teachers. ChatGPT, mentioned above on several other occasions, is one of the tools serving this particular purpose as it can become an indispensable personal assistant to both provider and the recipient of language training.

Of course, the use of language models that allow you to complete tasks without much effort raises concerns about cheating, academic dishonesty and, above all, the loss of the ability to learn in students. This is already a concern for New York City public schools, which block such chatbots in their school networks. [14: 635]. But most researchers on this issue do not agree with such a decision. Chatbots do not need to be banned. Rather it is a good idea to learn about their capabilities and use those in the educational process. ChatGPT and other AI-based tools can become a teacher's assistant in creating educational materials, lecture notes, textbooks, assessment tasks and tests adapted to the abilities of particular academic groups. Under certain conditions, a chatbot can create a list of potential topics for discussion, organize constructive feedback based on student performance, encourage students to directly interact with course materials. It can be used to develop interactive exercises, such as in problem-based, challenge-based or case studies that develop critical thinking. That is why it is extremely important to find a balance between the use of AI technologies and traditional training methods. After all, by working with AI, researchers can better understand how people interact with language models, which in turn can lead to the development of new algorithms and methods for processing and analyzing natural language data.

Conclusions. As we can see, a truly modern and effective educational process becomes almost impossible without the use of the latest technical developments, such as tools and technologies that work on artificial intelligence algorithms. Their potential in education is only just beginning to be truly evaluated by scientists, educators and practicing teachers, but it is already becoming clear that this tool will soon open up unprecedented opportunities for improving education. And language training is no exception here, but rather the key to using such digital tools. Because it is precisely the language models

that the machine learns from the boundless information provided, as well as its ability to communicate (albeit relatively naturally), are the fundamental functions and applications of currently known artificial intelligence models.

However, no matter how and by whom they are used in the educational process, the real challenge at present remains the ethics of this use. Therefore, teaching students, along with basic AI literacy, a range of ethical issues related to the use of artificial intelligence should occupy a prominent place alongside an understanding of the nature of AI and the technical aspects of its application. These are the tasks that are relevant today both for developers of various AI-based programs and services, and for educators around the world. Only together will scientists and practitioners in these two areas be able to create an effective, inclusive, and motivating learning environment that will operate according to the principles of academic integrity.

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ПЕРСПЕКТИВНІ НАПРЯМКИ ЗАСТОСУВАННЯ ШТУЧНОГО ІНТЕЛЕКТУ У МОВНІЙ ПІДГОТОВЦІ СТУДЕНТІВ-ІНОЗЕМЦІВ

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В умовах повномасштабної війни навчальні заклади України змушені були перейти на дистанційне навчання. Ця трансформація освітнього простору сприяла швидкому впровадженню цифрових технологій, що активно інтегруються у навчальний процес, а відтак суттєво змінила методичні підходи та технології, з допомогою яких здійснюється мовна підготовка студентів-іноземців на початковому етапі навчання. Вже досить давно інформаційно-комунікаційні технології стали частиною навчального процесу, вдосконалившись і урізноманітнившись настільки, що в будь-якому українському ЗВО підготовчі відділення та факультети застосовували усе доступне обладнання (від світлового проектора до мультимедійної дошки) і програмне забезпечення (від простих редакторів, інтегрованих в MS Office до багатофункціональних оболонок на кшталт hot potatoes і Moodle), різноманітні Інтернет-ресурси (наприклад, віртуальні дошки, кастомізовані мультимедійні вправи) та освітні ігрові платформи (наприклад, Kahoot!, Quizzes тощо) щоб забезпечити основні принципи навчання – системність, послідовність і візуалізацію – для підвищення його ефективності та результативності, а також підвищити мотивацію здобувачів освіти.

Проте на початку 2020-х відбувся новий виток у розвитку технологій, який знаменувався появою та блискавичним поширенням генеративного штучного інтелекту. Саме на його ролі в освіті та повсякденному житті фокусується дана стаття, в ході якої автори намагаються довести ефективність, доцільність і переваги використання ШІ в мовній підготовці іноземних громадян на початковому етапі навчання. Адже хоча застосування штучного інтелекту в освітній системі є відносно новим напрямком,

воно має значний потенціал. Щоб по-справжньому зрозуміти його можливості, важливо розібратися в сутності штучного інтелекту та принципах його роботи, так само як і роботи з ним. Відповідно, у даній статті розглядаються ключові визначення штучного інтелекту та його філософські інтерпретації. Також обговорюються сфери застосування цієї передової технології.

Особлива увага приділяється перспективним напрямкам використання штучного інтелекту у мовній освіті, зокрема іноземців, таким як персоналізоване та адаптивне навчання, оцінка знань, проміжне тестування, використання ігрових технологій в освітньому процесі, розвиток інших інноваційних підходів із допомогою програм і застосунків, які працюють на алгоритмах штучного інтелекту, значно спрощуючи процес навчання як для викладачів, так і для студентів.

Ключові слова: автоматизоване оцінювання, гейміфікація, генеративний ШІ, освітній простір, персоналізація, чат-бот, штучний інтелект.

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