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## POSSIBILITIES OF USING ARTIFICIAL INTELLIGENCE IN FOREIGN LANGUAGE TEACHING

The article is devoted to the research of issues related to the development of artificial intelligence. It is studied the possibilities of information and communication technologies using in general and specifically of artificial intelligence, from the perspective of their suitability for foreign language teaching. Some of the advantages and disadvantages that can be encountered by students in the study of foreign languages are analyzed. The specific areas of work with AI, which can increase the efficiency of foreign languages teaching, are described. It is briefly reviewed and differentiated some digital learning systems as alternative resources for foreign language learning. The author justifies the use of virtual linguistic interaction in the information and educational space: virtual teachers in the e-learning environment, interactive agents (chatbots) in the process of learning foreign languages. Classical pedagogical technologies with the concomitant use of digital intelligence allow for alternative learning models implementation and make the transition from reproductive means of learning to innovative-reflexive ones. Artificial intelligence with a written or verbal interface language should make the work of a teacher more meaningful, taking on the implementation of repetitive tasks. Artificial intelligence is an area of innovative technologies that is currently developing rapidly, which necessitates the development of appropriate legislative support in this area, which is difficult without a correct understanding of the term "artificial intelligence." The main goal of artificial intelligence research can be considered the development of software products, methods and models that will allow artificial devices to implement purposeful behavior and intelligent thinking.

**Key words:** artificial intelligence, foreign languages, educational process, modern technologies, communication.

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## МОЖЛИВОСТІ ВИКОРИСТАННЯ ШТУЧНОГО ІНТЕЛЕКТУ У ВИКЛАДАННІ ІНОЗЕМНИХ МОВ

Стаття присвячена вивченню та дослідженню поняття штучного інтелекту. Досліджено можливості використання інформаційно-комунікаційних технологій загалом і штучного інтелекту зокрема з точки зору їх придатності для навчання іноземних мов. Проаналізовано деякі переваги та недоліки, з якими можуть зіткнутися студенти під час вивчення іноземних мов. Описано конкретні напрями роботи з ШІ, які можуть підвищити ефективність викладання іноземних мов. Коротко розглянуто та виокремлено такі цифрові системи навчання як альтернативні ресурси для вивчення іноземної мови. Обґрунтовано використання віртуальної лінгвістичної взаємодії в інформаційно-освітньому просторі: віртуальних викладачів у електронному навчальному середовищі, інтерактивних агентів (чат-ботів) у процесі вивчення іноземних мов. В статті наголошено на тому, що класичні педагогічні технології з супутнім використанням цифрового інтелекту дозволяють реалізовувати альтернативні моделі навчання та здійснюють перехід від репродуктивних засобів навчання до інноваційно-рефлексивних. Штучний інтелект з письмовою або вербальною мовою інтерфейсу повинен зробити роботу вчителя більш змістовною, взявши на себе виконання повторюваних завдань. Проаналізовано штучний інтелект як сферу інноваційних технологій, які наразі стрімко розвиваються, що зумовлює необхідність розробки відповідного законодавчого забезпечення в цій сфері. Викладено перспективи розвитку штучного інтелекту, у т.ч. основні передбачення та переваги його можливостей найближчим часом. Зазначено, що основною метою досліджень штучного інтелекту як інформаційної технології можна вважати розробку програмних продуктів, методів і моделей, які дозволять штучним пристроям реалізовувати цілеспрямовану поведінку та розумні міркування. Окрім цього, визначено, що штучний інтелект як сучасний педагогічний механізм має важливе методологічне значення в процесі єднання освіти та науки.

**Ключові слова:** штучний інтелект, іноземні мови, освітній процес, сучасні технології, спілкування.

**Problem setting.** Artificial intelligence (AI) as a direction of modern science is becoming increasingly widespread in everyday life, becomes an integral part of e-commerce, marketing, manufacturing, medicine, automotive industry, and also plays an increasingly important role in education, including the study of foreign languages. Artificial intelligence not only makes it possible to digitalize many processes, but to make them more efficient, increasing labor productivity and complementing human capabilities. The term artificial intelligence was first coined by John McCarthy in 1956 when he held the first academic conference on the subject.

**Analysis of recent researches and publications.** Paulus Cerka, Jurgita Grigene and Gintare Sirbikitė note that artificial intelligence is, in a number of ways, a clearly insufficiently studied phenomenon. Jost N. Kok, Egbert J. W. Burse, Walter A. Kosters point out that the precise definition and meaning of the term “intelligence,” and even more so “artificial intelligence,” is a subject of heated debate. Some authors define artificial intelligence broadly as a computerized system that exhibits behavior that is widely perceived as requiring intelligence. Others define artificial intelligence as a system that can rationally solve complex problems or take appropriate actions to achieve its goals, regardless of conditions. Ronal Chandra and Yoga Prihastomo note that artificial intelligence can be considered as the field of study and development of computer programs that act intelligently, which in many ways is the ultimate goal of computer programming. According to the standard definition, artificial intelligence is the theory and development of computer systems capable of performing tasks that require human intelligence, such as visual perception, speech recognition, decision making and translation between languages.

**The objectives** of this study are: 1) to reveal the fundamental concepts of artificial intelligence technologies in the educational process; 2) to form competences for effective use of artificial intelligence tools in future professional activities; 3) to analyze the capabilities of artificial intelligence in teaching foreign languages to students of non-linguistic specialties.

**Presentation of the main material.** The use of intelligent systems in the educational process of foreign languages has its advantages and may become promising in the future. The feasibility of developing the topic under study lies in the need research on the problem of using AI for teaching a foreign language in modern conditions in order to increase the richness of the educational process:

– organizing cognitive communication activities with native speakers and members of the online community learning a foreign language;

– formation of information culture based on linguistic knowledge, allowing you to work in a telecommunications environment (Вікторова та ін., 2021: 166).

We believe that artificial intelligence in the higher education system is one of the digital learning technologies that is capable to perform simple logical tasks, communicate with students, simulating various professional situations, process large amounts of information and reproduce requested data in the shortest possible time, which can significantly help students in performing routine work. According to research data from large corporations such as Intellias, Alphary, Microsoft, working on the development and implementation of AI, artificial intelligence algorithms have great potential for the development of e-learning in all spheres of life. International corporations are already using AI to train their employees in foreign languages. It should be noted that learning a new language is a very difficult, but useful and popular activity. New acquaintances, business opportunities, travel and access to a wealth of information are just some of the benefits. Artificial intelligence claims that it is possible to truly understand the features of a language without speaking to native speakers (Поліщук та ін., 2022: 105).

Let’s take a look at some of the technologies enabled by AI.

1. Language bots. Chatbots have come a long way from often useless “dummies” to intelligent assistants, communication with which is sometimes indistinguishable from a conversation with an educated person with a good sense of humor. Students at any time can enter into a dialogue with the bot and learn in the process of foreign language communication, which is lacking in real life. Chatbots provide personalized responses to a person’s queries and can even assess their language skills or give advice on what they need to improve. At the same time, students are not afraid to make mistakes, as if they were communicating with a real teacher. Today, there are a large number of chatbots that are most often used on the Internet: A.L.I.C.E., Mitsuku, Splotchy, Cleverbot, Existor, Elbot, iGod, etc. Language communication with such chatbots is useful for overcoming the language barrier and providing the opportunity for unlimited foreign language communication.

2. Personalized textbooks. You cannot assume that using the same textbook will be effective for all students because people learn differently and at different speeds. This is why personalized textbooks are in high demand. When AI is able to assess a

learner's level of preparation and the speed of his progress, it can adapt to his needs and also provide him with the necessary training materials. Customizing textbooks can also be useful for teachers. If teachers could upload their educational programs into an artificial intelligence system, the system would be able to generate textbooks customized for a specific institution, course, or even group of students.

3. Algorithms for studying artificial intelligence. There are hundreds of algorithms that combine artificial intelligence and language learning to help computers become smarter. AI needs to think fast, and algorithms can help when there is too much data. Language processing allows machines to read and understand human language; collocation extraction can be used to extract information, classify documents, and solve language generation problems.

4. Experience of Intellias with AI in learning foreign languages. When it comes to implementing artificial intelligence in language learning, German IT company Intellias is considered as a leader in this process. Together with Alphary, it has created a suite of smart Android, iOS, and web language learning apps that help students master English vocabulary. These apps use the Oxford set of dictionaries and integrated AI called FeeBu (Feedback Butterfly) to mimic the behavior of an English teacher who provides automated intelligent feedback. The app accesses a wide variety of authentic English texts to provide contextualized vocabulary practice. FeeBu uses four main criteria to assess a learner's success in language acquisition: grammar, spelling, meaning and lexical choice. The Intellias team has implemented a component that automatically generates blank-spaced exercises and answer choices when given a title and semantic context. A system has also been created that automatically evaluates the letter and analyzes it for grammatical errors (Погореленко, 2018: 24).

The app, created by Intellias and Alphary, was so successful that Oxford University Press, the world's largest publisher of English language teaching materials, acquired it and licensed the technology for worldwide distribution. Years of experience in the field of e-learning has allowed Intellias to develop an original language learning application based on the internationally recognized Leitner flashcard methodology and intelligent native language learning algorithms, including data mining, machine learning, corpus statistics and semantic analysis. The Intellias team analyzed and redesigned the multilingual dictionary, created different types of language practices for better use, and also added the ability to receive rewards, prizes, and record achievements to motivate users (Пельчер, 2018: 73).

It should be said that once artificial intelligence and education finally come together, the challenges of acquiring learning experiences will reach a new level. Personalization of learning, instant feedback and adaptation to individual needs will have a significant impact on learner development.

From a didactic point of view, online communication processes using AI not only represent a path to achieving a goal, but also may be the target or one of them. Learning a language is about using it, as language is learned through receptive and active use. The main task when teaching a foreign language is to provide students with as much variety as possible ways to use it. The didactics of using chats for self-study in a foreign language are relatively well studied. Chats are suitable for supporting organizational work and collaboration, for example in the context of cross-network projects between two groups of students: since direct feedback is possible, suggestions and agreements can be quickly exchanged. Quick response in chat facilitates virtual brainstorming or "cyberstorming" based on the spontaneity of interaction and the inverse dynamics of effectively collecting common thoughts. Computer communication, imitation of interaction in natural language with a virtual interlocutor expands these possibilities (Левчук, 2015: 206).

Conversational systems follow the principle of simple chats, which are designed for intuitive communication in language. The student can communicate freely, for example within certain keywords. It should be noted that the AI interlocutor is capable of conducting a discussion within the framework of correctly selected keywords. The problem is that most systems only respond to simple keywords and have serious problems with grammatical correctness. Such interactive artificial learning systems operate within clearly defined scenarios with prescribed dialogue cues and an associated error matrix. In this context, they can distribute learning content, ask questions and provide progressive feedback.

The use of "conversational agents" (chatbots) capable of creating responses to input sentences taking into account language norms and rules in the educational process in foreign languages is becoming increasingly justified. The already achieved level of syntactic processing of the language allows developers to create more advanced versions of chatbots containing a sufficient number of templates for response. Jabberwacky, developed in the late 1990s, was the first AI bot capable of "simulating natural human chat in an interesting, entertaining and humorous manner." "Jabberwacky" learns from

his previous conversations with people. It functions by storing everything said, uses contextual pattern matching techniques to select the most appropriate response, has no hard-coded rules, rather relying solely on previous conversations, and is designed to communicate. Cleverbot is a chatterbot web application. It was created by British AI scientist Rollo Carpenter and launched in October 2008. It was preceded by Jabberwacky. Using “Cleverbot” allows you to practice written English/German for free, in Japan, for example, students pay to learn a foreign language with chatbots or robots. Despite the availability of use and the ability to conduct meaningful conversation, most of the answers from Cleverbot don’t correlate with the input context, which doesn’t make it possible to maintain a conversation on one topic for a long time, confirming the insufficient “reasonableness” of the service. Modern commercial chats, for example, developed using LinguaBot technology, are conversational agents with complex, goal-directed behavior, capable of analyzing both individual words and grammatical structures of input using “customizable” templates. These models are used in a conversational context and are composed of specific token qualifiers for the response from the chatbot. Various communication scenarios are possible – a conversation with a user, reading or writing information, opening a web page or updating a database, combining abstracts. This rich range of responses allows for intelligent conversation with the user and also provides the ability to return to the original task. The communication capabilities of AI are actively developing, so we can talk about exponential growth in the capabilities of conversational agents. Virtual learning environments or educational virtual worlds, where students and teachers are present at the lesson in the form of three-dimensional characters – avatars, and the virtual lesson is similar to a traditional “live” one, including gestures and facial expressions (embodiment), represent the most advanced developments. For example, the “Academia” environment, which allows for virtual recording of classes and the creation of virtual content for a new type of distance learning, or the “Max” pedagogical agent, which is being developed as a virtual museum guide at the Bielefeld University in Germany (German: Universität Bielefeld).

The undeniable advantage of using virtual learning environments for learning a foreign language is that an online course is cheaper than a traditional one, and there are free resources for self-paced online learning. Such resources make it possible to return to the material covered, repeat more complex topics,

study at a convenient time, having the opportunity to continuously communicate with the teacher. This is why chatbots are the most logical and affordable alternative for in-person training.

But it should be noted that the idea of completely robotizing the educational process has a number of significant drawbacks. In the educational process, the teacher plays the role of a mentor who is able to intuitively choose the right reactions to different life situations. A machine as an information carrier is not able to choose the right action intuitively, but only after analyzing a large number of available options. Thanks to its ability to learn, AI can learn both “good” and “bad”. But who will be responsible for AI errors that can harm the learning of educational material? Therefore, artificial intelligence at the present stage can only be considered as an effective assistant that is capable of analyzing the educational process. Unlike a living person, a robot cannot think logically. In modern linguistics, consideration of the basic logical relations in natural language using simplified models allows us to determine the basis for creating an artificial thinking mechanism identical to the human thinking mechanism. Any language, as an example of a natural living language, can be characterized as a fairly complex and multifaceted system. A statement, having a certain semantic meaning, pursues a specific goal and is guided by logic. In this regard, it becomes increasingly important to analyze the meaning and structure of each statement in speech with the aim of analyzing it from the point of view of logic. Linguists pay special attention to the study of simplified logical models in order to reveal the essence of more complex structures. Interaction with a dialogue agent within the framework of the question-answer system designed by the developers creates problems for building productive and correct communication. The fact that the linguistic behavior of most people is only partially predictable and occurs outside of dialogue scenarios with chatbots makes these scenarios unstable, incoherent, i.e. incapable of logical-semantic, stylistic and grammatical correlation with the integrity of the input text.

**Conclusions.** Thus, AI is already used today in the practice of teaching foreign languages in universities, so it is impossible to ignore its presence. Now is the time for universities to rethink their roles and relationships with AI technologies and their owners. At the same time, higher education institutions must be aware of the full range of opportunities and challenges that are emerging thanks to AI. These new opportunities will promote lifelong learning in a strengthened model that can maintain the integrity of the core values and goals of higher education. It is

important to conduct further research to identify new roles for teachers in the educational process, as well as new ways of learning in higher education institutions, with an emphasis on imagination, creativity and innovation, which are unlikely to ever be replicated by machines.

#### BIBLIOGRAPHY

1. 1. Viktorova L. V., Kocharian A. B., Mamchur K. V., Korotun O. O. Artificial intelligence and chatterbots application in foreign language learning. Інформаційно-комунікаційні технології в освіті. Інноваційна педагогіка. 2021. Вип. 32, т. 2. С. 166–173.
2. Левчук А. Штучний інтелект: лінгвістичні аспекти. Науковий вісник Східноєвропейського національного університету імені Лесі Українки. 2015. № 4. С. 205–209.
3. Пельчер М. Переваги та недоліки застосування штучного інтелекту у сферах управління. Природничі та гуманітарні науки. Актуальні питання : Міжнар. студ. наук-техн. конф. 2018. С. 72–73.
4. Погореленко А. К. Штучний інтелект : сутність, аналіз застосування, перспективи розвитку. *Науковий вісник херсонського державного університету*. 2018. № 32. С. 22–27.
5. Поліщук О., Поліщук О., Дудченко В. Філософія штучного інтелекту в освітньому процесі. *Humanities studies: Collection of Scientific Papers*. 2022. Вип. 13 (90). С. 103–109.

#### REFERENCES

1. Viktorova L. V., Kocharian A. B., Mamchur K. V., Korotun O. O. (2021) Artificial intelligence and chatterbots application in foreign language learning. *Informatsiino-komunikatsiini tekhnolohii v osviti. Innovatsiina pedahohika*. Vyp. 32, t. 2. S. 166–173.
2. Levchuk A. (2015) Shtuchnyi intelekt: lnhvistychni aspekty. [Artificial intelligence: linguistic aspects] *Naukovyi visnyk Skhidnoievropeiskoho natsionalnoho universytetu imeni Lesi Ukrainky*. № 4. S. 205–209. [in Ukrainian].
3. Pelcher M. (2018) Perevahy ta nedoliky zastosuvannia shtuchnoho intelektu u sferakh upravlinnia. [Advantages and disadvantages of using artificial intelligence in the spheres of management] *Pryrodnychi ta humanitarni nauky. Aktualni pytannia : Mizhnar. stud. nauk-tekhn. konf.* S. 72–73. [in Ukrainian].
4. Pohorelenko A. K. (2018) Shtuchnyi intelekt : sutnist, analiz zastosuvannia, perspektyvy rozvytku. [Artificial intelligence: essence, analysis of application, prospects of development]: *Naukovyi visnyk khersonskoho derzhavnoho universytetu*. № 32. S. 22–27. [in Ukrainian].
5. Polishchuk O., Polishchuk O., Dudchenko V. *Filosofia shtuchnoho intelektu v osvitnomu protsesi*. [The philosophy of artificial intelligence in the educational process]: *Humanities studies: Collection of Scientific Papers*. 2022. Vyp. 13 (90). S. 103–109. [in Ukrainian].