# ОСВІТНІ ІННОВАЦІЇ: ІДЕЇ, РЕАЛІЇ, ПЕРСПЕКТИВИ

**UDC 8.811.111.004.8**

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## USE OF ARTIFICIAL INTELLIGENCE IN TEACHING FOREIGN LANGUAGES IN HIGHER EDUCATION INSTITUTIONS

***Abstract***

*The article considers the concept of 'artificial intelligence', identifies its areas of application and emphasizes its particular effectiveness in the field of teaching and learning foreign languages. The author also considers the stages of development of this phenomenon among the latest technologies, philosophical aspects and its structural components.*

*Artificial intelligence (AI) is a branch of computer science that deals with the development of algorithms and systems capable of performing tasks that usually require human intelligence. Such tasks include pattern recognition, speech and decision-making, learning, planning, natural language processing and many others. AI can be implemented using various methods, including machine learning, neural networks, optimization algorithms and others.*

*AI systems are used to create personalized recommendations, which increases user satisfaction from using products and services. For example, personalized recommendations on streaming platforms or individual recommendations for students in the process of learning foreign languages, which helps to increase significantly their starting level at the subsequent stage of learning. Scientific research methods also allow us to conclude on the feasibility of using a number of educational platforms specified in the article for the purpose of mastering numerous foreign language skills.*

*The work also highlights the basic principles of artificial intelligence for a better understanding of its functioning in the field of education. The article also touches on the moral and ethical problems of using artificial intelligence in learning foreign languages. A generalized analysis of scientific ideas regarding the role of artificial intelligence in the history of the development of modern society is made. Artificial intelligence in the form of purely technical platforms is used in practicing listening, reading, writing and speaking, but the effectiveness of each of them is determined, of course, with the experience of using them by students and teachers. We also take into account the numerous advantages of this technology indicated in the text of the article.*

***Key words:*** *artificial intelligence, intellectual activity, learning, platforms, risks, teaching foreign languages, technologies.*

**Introduction.** Artificial intelligence was created with the aim to facilitate various processes in human life. One of the spheres where it is widely used is teaching foreign languages. It is our great assistant not only in the field of individual learning and teaching in secondary schools but also in higher educational establishments and the aim of this article is to dwell upon the problems and perspectives of this work.

 **DOI** https://doi.org/10.37406/2521-6449/2025-1-5

Artificial intelligence is generally considered as the ability of a computer to learn, make decisions, as well as to perform actions that are inherent in human intelligence, to perform tasks that are considered the prerogative of humans. In our opinion, this definition is mainly functional, descriptive in nature but it contains the main idea: intelligent machines created by humans are equal to humans themselves.

The anticipation of the future effect of the moment when artificial intelligence (AI) will become a real entity in the world's evolutionary picture is unfolding in front of our eyes and makes each of us think carefully. Humanity is born with both the most optimistic forecasts and predictions about the most dramatic consequences of the presence of AI in our lives. Predictions about AI displacing humans from various types of intellectual activity in the labor market coexist with gloomy predictions about 'Apocalyptic AI' associated with the names of Hans Moravec, Raymond Kurzweil and other authors [1]. The formation of artificial intelligence, which, due to its extraordinary nature, requires human efforts in such fields of activity as mathematics, biology, psychology, and cybernetics obviously also requires certain efforts in the field of philosophy, the role of which is not limited to the formation of ethical foundations for human interaction with AI. It must comprehend the role of AI in the fate of civilization. It is this understanding that will allow a person to coordinate his efforts to form the AI model that will best meet the task of cooperation between AI and human intelligence, human society. Understanding this role is possible if we understand the very dynamics of how we form our ideas about AI.

It should be noted that artificial intelligence has an increasing impact in many areas of human activity. It helps people communicate with each other even across language boundaries, find information in the vast resources available on the Internet, solve complex problems that are beyond the competence of an individual expert and allows the deployment of autonomous systems, such as self-service and self-driving cars which handle complex interactions with the real world with little or no human intervention. So these applications may not be like the fully autonomous, conscious, intelligent robots envisioned in science fiction, but they are nevertheless very important and useful, and most importantly, they are real and exist today. But it is also undeniable that artificial intelligence carries certain risks. Many people (including such prominent ones as Bill Gates and Stephen Hawking) believe that the main risk of artificial intelligence is that it gets out of control [2]. Machines that can learn, reconfigure themselves, and make copies could outsmart the human race, outsmart us, and take over. To the researchers in the field this risk seems far reached. But they see other variations that need to be addressed urgently. It should be emphasized that AI algorithms, especially those embedded in the Internet and social media, have a major impact on the way who is engaged in dialogue with whom, how information is selected and presented, and how facts (valid or fake) are disseminated and competed in the public sphere. However, these AI algorithms are now responsible for creating a post-truth world, the capture of democratic decision-making processes, and the dangerous polarization of society. Accordingly, these developments significantly complicate the solution of important problems facing our society, such as mitigating climate change, reducing pollution on the planet, achieving economic prosperity for a growing population, overcoming mass migration, etc. All of them require decisive collective action, namely, political consensus. Artificial intelligence is a system that works by combining large amounts of data with intelligent processing algorithms. AI algorithms work in a way that allows it to learn from the patterns and features analyzed. During each cycle of information processing, the system evaluates its performance and uses the results to improve.

Research methods used in the article include empirical data (based on observation and descriptions) and theoretical ones (based on analysis, synthesis, explanations, classifications and generalizations). **The aim of the article** is to study the history of artificial intelligence development, approaches to its classification, its main components and to analyze the existing platforms for better English learning and teaching in the higher educational establishments of Ukraine.

In the development of the logic of our ideas about artificial intelligence several stages can be distinguished: 1. The information approach to thinking of Norbert Wiener (as well as Maurice Wilkes (Great Britain, 1949), John Mauchly, John Presper Eckert and John von Neumann (USA, 1952) which gave an understanding that statistical methods for calculating the amount of information are applicable to any signals and messages in systems of any nature including the human brain. 2. The technical approach to machine intelligence is the era of the 'birth of machine thinking' of artificial intelligence, its actual appearance in the real world associated with the names of John McCarthy, Marvin Minsky, Nathaniel Rochester and Claude Shannon in a scientific project in 1955 when they formulated the idea of artificial intelligence as the ability of a machine to perform various actions and even engage in self-learning. The first electronic computing machines appear, capable of processing a huge amount of information. The enormous speed with which AI is already capable of performing analytical operations is striking. 2. Heuristic approach. The development of information technologies, which allows us to move from mechanically sorting out all possible situations for solving a problem to the accumulation of programs and algorithms which makes it possible to optimize the course of cognitive activity, concentrate efforts on the formation of creative approaches to solving problems. The philosophical and psychological research of S. L. Rubinstein, who believed that intellectual activity is a specific form of regulation of the behavior of an individual in new changing conditions, when the behavior that is new for the individual is carried out not 'blindly', but on the basis of the allocation of objective conditions essential for action, as well as on the concept of culture as a system of suprabiological programs of activity. A heuristic model of intelligence, aimed at solving creative tasks, is emerging being improved and developed. 4. Phenomenological approach. The heuristic model of intelligence, which, with creativity, innovation, culture, as a way of improving activity, required the development of the ability to comprehend, realize and reflect, i.e. the ability to self-awareness. If we use symbols, we can say that there was a transition from the 'Descartes code', which carries the characteristics of abstract thinking, to the 'Leibniz code', as the

characteristics of the soul, as a monad of the highest level, capable of self-awareness in which AI is simultaneously aimed at reproducing the new and reflecting on its own actions in the process of this creation. There is a transition to a model of intelligence, which can be conditionally called phenomenological. Fourth-generation computers are able not only to concentrate on constructing similar robots, but also at the same time they are able to change the technological chain depending on complaints: problems and difficulties that arise in the practical operation of their products. 5. The cybernetic approach is a consequence of a new stage of technical creativity in the information sphere, the formation of super-powerful computer systems capable of imitating reality, the formation of operating models of large, complexly organized systems, which create the basis for their automated control. The main aspect of implementing the cybernetic approach is to predict the future state of the system and implement reliable management not on the principle of autopilot (deviation from the course and return to the proper state), but the formation of certain strategies for achieving the goal, the combination of mathematical matrices of computer programs and the philosophy of the system's movement. In a sense, this is the reproduction of N. Wiener's information model in practice, the implementation of O. Subetto's ideas about the ability of intelligence to manage its own future. It is from this starting point – the cybernetic vision of the role of AI – that we must comprehend this path to the future and evaluate from the perspective of the future the role of AI in the fate of human civilization [4, p. 77–80].

Speaking about AI as a modern tool of learning and teaching foreign languages we cannot but mention its structural components: 1. Machine Learning (ML): algorithms that detect patterns and generate insights from data which give AI the ability to learn. 2. Deep Learning: a subcategory of ML that allows AI to mimic the neural network of the human brain to recognize complex patterns and noise in data. 3. Neural Networks: forming the basis for deep learning by mimicking the neurons of the brain consisting of hidden input and output layers that contain thousands or millions of information nodes that are fed into the input layer. Machines learn by comparing the results of the network and adjusting the connections, and thresholds [5].

Keeping to the trajectory of the research it is obligatory to mention a few words about the basic principles of artificial intelligence which include: 1. Supervised learning which presupposes using machine learning (ML) algorithms to train AI systems on a data set that has correct answers. This allows AI systems to improve their performance as they learn. 2. Unsupervised learning. It is using ML to train AI on a data set without explicit correct answers. The systems use their own data analysis methods to identify patterns and draw conclusions. 3. Deep learning. That is using multiple layers of neural networks to create systems that can process huge amounts of data and draw accurate conclusions. Deep learning is used to create tools for speech recognition, computer vision, and more. 4. Neural networks. That is using models that replicate the human brain and provide AI systems with the ability to learn and draw conclusions based on their experience. 5. Genetic optimization algorithms. It's using evolutionary algorithms to create AI systems that can adapt and improve their results based on their own experience and previous decisions. 6. Natural Language Processing. That presupposes developing systems that can analyze and understand natural language and use this information to answer questions, translate text, etc. 7. Clustering. It is using algorithms that allow AI systems to classify data and draw conclusions based on similarities and differences between them. These principles and technologies enable the development of AI systems that can solve various tasks and draw conclusions based on their own experience [3].

One of the main benefits of implementing AI is increased productivity. AI can help automate many processes and tasks, which allows you to increase productivity and reduce the time it takes to complete tasks. Where it is useful: in any manufacturing industry, where AI can be used for quality control, optimization, and error minimization. Another benefit of AI is the reduction in errors. AI can help reduce errors related to the human factor, as it is able to analyze data more accurately and faster than a person. It is also useful in medicine, where errors can have serious consequences for patients. AI can also help in data analytics. It can process large amounts of information and find hidden patterns and trends that may be invisible to a person. Therefore, another benefit of AI is increased prediction accuracy, which will allow you to estimate the probability of certain outcomes based on data analysis and previous experiments. In this article we will analyze whether an AI-based neural networks for learning English can replace a teacher or it can be 'a helping hand' in practicing and mastering new skills in teaching and learning processes. Here is one of the multiple possible lists of such platforms.

One of the first ones is 'Babbel'. An application from German developers that uses AI algorithms to analyze progress and provide feedback and exercises adapted to your specific needs. The app has a voice recognition program, so you can check your speaking skills. An analogue of this application is 'Duolingo'. 'Babbel' is quite a popular language learning application that works on the basis of AI. The application offers courses in 14 languages, including Spanish, French, German, Italian and Portuguese. 'Babbel' uses AI to personalize learning experience and offers a range of interactive lessons and dialogues to help learners improve their speaking, listening, and writing skills.

The next on our list is 'Pimsleur'. The platform uses voice recognition technology with the help of AI to communicate in English. Each lesson takes 30 minutes.

Then comes 'Gemini'. It is a bot for learning English from Google that can be used to generate real English lessons. It will help you: learn and explain grammar rules, the meaning of words, idioms, fixed expressions, phrasal verbs with examples of use, even translate everything into Ukrainian; create exercises to test your knowledge of grammar, vocabulary, reading; generate texts with tasks for different levels of language proficiency. An analogue of this application is chat GPT the advantages of which have already been described in numerous articles. And working prompts for improving communication skills were analyzed on the YouTube channel.

'Grammarly' is the next on this list of useful applications and programs. It is a program with artificial intelligence

for learning English grammar and improving writing skills. It will help you check grammatical and stylistic errors in any type of text: from presentation texts to messages in chats.

'Quizlet' is a gamified online trainer for improving vocabulary. It is very convenient and user-friendly. It is a favorite platform of a great many teachers of the English language. You can add your own words and perform many exercises with them until you master the material; you can use ready-made cards offered by the program.

'Talkpal' is a GPT-based AI language tutor. Users can communicate on an unlimited number of interesting topics in a written or spoken form receiving messages in a realistic voice. Engaging features such as chat, role-playing, characters, debates, call mode, sentence mode, and photo mode allow users to practice over 57 languages.

'Rosetta Stone' is a language learning app that helps learners develop language skills through immersion. The app uses AI to personalize the learning experience and offers a range of interactive lessons and exercises to help learners improve their speaking, listening, and writing skills. 'Rosetta Stone' offers courses in 24 languages, including Spanish, French, German, Italian, and Japanese.

'Memrise' is a language learning app that uses artificial intelligence to personalize learning and offers a range of interactive lessons and games to help learners improve their vocabulary and grammar skills. The app offers courses in 22 languages, including Spanish, French, German, Italian, and Japanese also.

'Ling' is a language learning app designed to make learning new languages fun and interactive. Lessons are tailored to different levels of language proficiency including games, quizzes, and real-life dialogues. 'Ling' supports multiple languages and focuses on developing conversational skills, making it an ideal tool for both beginners and advanced language learners.

'Busuu' is a language learning app that offers courses in 12 languages including Spanish, French, German, Italian, and Japanese. The app uses artificial intelligence to personalize the learning process and offers a range of interactive lessons and games to help learners improve their speaking, listening, and writing skills.

'Hello Talk' is a language learning app that allows users to communicate with native speakers to improve their language skills. The app uses artificial intelligence to help learners find the right conversation partners and offers a range of interactive lessons and exercises to help learners improve their vocabulary, grammar and pronunciation.

'Tandem' is with the same set of variations that allow us to speak to native speakers. It also helps learners find the right partners and offers a range of interactive lessons and exercises to boost learners to better their language skills.

'Linguist' is a language learning app that uses artificial intelligence to personalize the learning process and offers a range of interactive lessons and games to help learners improve their vocabulary and grammar skills. The app offers courses in French, German, Spanish, and Estonian. AI-powered language learning apps have revolutionized the way we learn languages. They offer personalized learning experiences and make language learning more interesting and engaging. Whether you are a beginner or an advanced language learner, there is a language learning app that can help you achieve your goals.

**Conclusions.** So, as far as you can see, there is a great number of useful, helpful interactive and effective platforms to be chosen in the process of mastering English and which of them to use is a personal decision of a teacher and a student. Learning experience will show the effectiveness of the chosen ones.

Although it is a powerful tool of learning we cannot but mention a few facts concerning AI disadvantages. One of the drawbacks of AI is its lack of creativity, as it is AI and it is related to machines, so special programs are developed to vary the complexity of tasks. Creativity reflects the mental activity of thinking humans, so an AI system is not equipped with the mental activity that humans have to recognize changes in the context of programs or data that could affect the validity of predictive assumptions. Thus, an AI system may unknowingly apply the programmed methodology to assess students' knowledge in an inappropriate manner which will lead to an error. Transparency in AI refers to what information is collected or used, what programs are programmed and fed into the AI tasks. Therefore, AI-driven learning is, to some extent, disrupting traditional approaches to learning in higher education and shaping future with new learning technologies in education. AI in education predicts huge data sets using complex algorithms, providing personalized and adapted learning experiences for students. They receive personalized learning, instant feedback, and access to immersive technologies such as augmented and virtual reality in education.

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# ВИКОРИСТАННЯ ШТУЧНОГО ІНТЕЛЕКТУ У ВИКЛАДАННІ ІНОЗЕМНИХ МОВ У ЗАКЛАДАХ ВИЩОЇ ОСВІТИ

***Анотація***

*У статті розглянуто поняття «штучний інтелект», визначено сфери його застосування та підкреслено особливу ефективність у сфері викладання та вивчення іноземних мов. Автор розглядає також стадії розвитку цього феномену серед новітніх технологій, філософські аспекти та його структурні компоненти.*

*Штучний інтелект (ШІ) — це галузь інформатики, яка займається розробкою алгоритмів і систем, здатних виконувати завдання, які зазвичай потребують людського інтелекту. До таких завдань належать розпізнавання образів, мова та прийняття рішень, навчання, планування, обробка природної мови та багато інших. ШІ може бути реалізований різними методами, включаючи машинне навчання, нейронні мережі, алгоритми оптимізації та інші. Системи ШІ використовуються для створення персоналізованих рекомендацій, що підвищує задоволення користувачів від використання продуктів та послуг. Наприклад, персоналізовані рекомендації на стрімінгових платформах або індивідуальні рекомендації для студентів у процесі вивчення іноземних мов, що допомагає значно підвищити їх стартовий рівень на подальшому етапі навчання. Науково-дослідницькі методи дозволяють також дійти висновку щодо доцільності використання цілого ряду освітніх платформ, зазначених у статті, з метою опанування численних навичок іноземної мови. В роботі також виділені базові принципи штучного інтелекту задля кращого розуміння його функціонування у сфері навчання.*

*Стаття також торкається морально-етичних проблем застосування штучного інтелекту при вивченні іноземних мов. Зроблено узагальнений аналіз наукових ідей щодо ролі штучного інтелекту в історії розвитку сучасного суспільства. Штучний інтелект у вигляді суто технічних платформ використовується при відпрацюванні аудіювання, читання, письма та говоріння, але ефективність кожної з них визначається, звичайно, з досвідом використання студентами та викладачами. Зважаємо також на численні переваги цієї технології, зазначені в тексті статті.*

***Ключові слова:*** *викладання іноземних мов, інтелектуальна діяльність, навчання, платформи, ризики, технології, штучний інтелект.*

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