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ГЕНЕРАТИВНЫЕ НЕЙРОСЕТИ В ВЫСШЕМ ОБРАЗОВАНИИ: ДИДАКТИЧЕСКИЙ ПОТЕНЦИАЛ И ЭТИЧЕСКИЕ ДИЛЕММЫ

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Аннотация. ***Введение***. В статье рассматриваются возможности и ограничения применения искусственного интеллекта (ИИ) в образовательном процессе в сфере преподавания иностранных языков.

Методы. В исследовании применяется анализ актуальных практик и стандартов использования ИИ в вузах России и Казахстана, обзор специализированных AI-инструментов, изучаются системы данных эмпирических исследований в области цифровой дидактики.

Результаты. Были определены основные преимущества ИИ, в том числе автоматизация рутинных задач, персонализированное обучение, генерация учебных материалов. Проанализированы основные риски, включающие угрозы академической честности, снижение умственной нагрузки студентов, формирование «иллюзии компетентности», недостоверность данных, правовые и этические вызовы, был представлен обзор AI-инструментов, используемых для формирования языковых компетенций. Предлагаются пути интеграции ИИ через инновационные формы оценивания и повышение цифровой грамотности преподавате-

лей. Особое внимание уделяется инструментам Speechify и ElevenLabs для развития языковых навыков.

Заключение. Делается вывод о необходимости сбалансированного подхода, сочетающего педагогические инновации с сохранением интеллектуальной самостоятельности студентов; авторы предлагают пути интеграции технологий в обучение, в частности с помощью разработки уникальных заданий, устойчивых к автоматической обработке и повышение цифровой грамотности преподавателей, применение ИИ при обязательной проверке студенческих работ.

Ключевые слова: генеративные нейросети, методы обучения, цифровая дидактика, генеративные модели, академическая честность, нейросетевые технологии в лингвистике.

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GENERATIVE NEURAL NETWORKS IN HIGHER EDUCATION: DIDACTIC POTENTIAL AND ETHICAL DILEMMAS

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Abstract. ***Introduction.*** This paper examines the uses, potential, and limitations of artificial intelligence (AI) in education, with a focus on foreign language teaching.

Methods. The study analyzes current practices and standards for using AI in universities in Russia and Kazakhstan, reviews specialized AI tools, and examines data systems from empirical research in digital didactics.

Results. The key benefits of AI were identified, including the automation of routine tasks, personalized learning, and the generation of educational materials. Key risks were analyzed, including threats to academic integrity, reduced student mental workload, the development of an «illusion of competence», data unreliability, and legal and ethical challenges. An overview of AI tools used to develop language competencies was presented. Ways to integrate AI through innovative assessment forms and improving the digital literacy of teachers are proposed. Particular attention is paid to the Speechify and ElevenLabs tools for developing language skills.

Conclusion. The authors conclude that a balanced approach is needed, combining pedagogical innovation with the preservation of students' intellectual independence. The authors propose ways to integrate technology into education, particularly through the development of unique as-

signments resistant to automated processing, improving teachers' digital literacy, and the use of AI in mandatory assessment of student work.

Keywords: Generative Neural Networks, Teaching Methods, Digital Didactics, Generative Language Models, Academic Integrity, Neural Network Technologies in Linguistics.

Introduction. Artificial intelligence (AI) has evolved significantly and at the current stage of development it is mainly associated with neural networks and deep learning. Generative neural networks are deep learning models optimized to approximate the probability distribution of a given dataset in order to synthesize new data with similar statistical properties through methods such as backpropagation and adversarial training" [6]. The potential of AI is particularly evident in foreign language teaching, as a means of pronunciation practicing and vocabulary expansion. Despite the fact that there are obvious advantages, the widespread use of AI might cause challenges in the education sphere, as it threatens academic integrity and causes risk of demotivating students from self-sufficient intellectual work. It also has issues with reliability and legal regulation. This article examines the contradictory aspects of AI application in education, analyzes specific tools in foreign language teaching, and proposes ways to balance the integration of technologies in order to minimize associated risks.

Methods. The methodological basis of the study is an analysis of existing practices, academic approaches, method of interpretation of isolated regulations of universities in Russia and Kazakhstan; empirical data on the implementation of AI in educational institutions and the effectiveness of adaptive platforms. The classification method was applied for AI tools functional analysis by category used for adaptive learning, language modeling, generative systems, etc.

Discussion and Results. To get the most out of technology while avoiding associated risks, a balance between using AI and interacting with a teacher should be maintained when learning foreign languages. Key areas of AI application in the field of teaching include speech recognition to improve pronunciation, practice phonetics and diagnose errors, spell checking and suggesting corrections, chatbots to develop speaking skills to increase fluency and confidence in communication [3; 9]. Common applications include grammar correctors that correct syntax errors; online games and applications to expand vocabulary, as well as personalized learning systems that adapt materials to students' interests, including aspects of culture and literature. Interactive dictionaries instantly translate words, making it easier to read literature in a foreign language, image and video generators help to better memorize vocabulary from these texts. According to a study by the National Research University Higher School of Economics, about two-thirds of the surveyed Russian institutions are using generative neural networks in test mode; most respondents apply the technology together with different digital communication services, such as Internet of Things and other technologies [5].

Currently, some universities in Russia and Kazakhstan allow their students to use neural networks as a tool for contextual analysis, selection of ideas and materials, for completing educa-

tional and research assignments for writing academic and scientific papers. At the same time, the generated data must be confirmed and supplemented by personal reasoning, processed information and independent conclusions, as well as other reliable sources. At the same time, students must process the information themselves. Some universities create local regulations that fix the permissible amount of information generated by a neural network, for example, no more than 35-45% in final scientific qualification works of students in higher education programs [6].

At the same time, these decisions are isolated and are not numerous in Russia and Kazakhstan, where in most cases the attitude towards generative neural networks remain ambiguous and wary. Firstly, morality and ethics in the use of AI leads to many university professors being cautiously optimistic about the technology. For example, Microsoft laid off 10% of its employees in early 2025 because their work was taken over by artificial intelligence. In addition, there are legal gaps in the area of liability of artificial intelligence for failures in the digital environment that have led to serious consequences. The problem of academic dishonesty in the context of the spread of artificial intelligence technologies remains quite acute. Modern advances in artificial intelligence, in particular the development of generative language models such as ChatGPT, pose serious challenges to the education system, since they provide students with tools to minimize intellectual effort when performing academic and research tasks. Instead of deeply analyzing the educational material, independently formulating thoughts and developing critical thinking, students delegate a significant part of work load to artificial intelligence. This leads to the fact that students are not able to develop critical competencies and skills [4].

The situation requires a fundamental transformation of the educational process, within the framework of which traditional methods of knowledge assessment require revision. One of the most pressing problems is the substitution of independent work with automated text generation. Modern neural network models are capable of generating scientific educational papers in a matter of seconds, writing essays, imitating the style and logic of human presentation. As a result, students, instead of mastering the discipline, limit themselves to superficial interaction with the content, without developing the skills of analysis, synthesis and argumentation, which creates the illusion of competence, while the real level of understanding of the subject remains low, which is proven by an oral survey of students on the generated materials presented by them [10; 11; 2].

Moreover, the widespread use of generative neural networks in the educational process contributes to the devaluation of academic integrity. Previously, plagiarism and cheating required minimal effort, including searching for completed works, manual copying of individual parts that were suitable in meaning, structure or topic. Currently, generating a unique text is becoming a trivial task; at this stage of development, anti-plagiarism systems are not always able to reliably determine whether the text was written by a person or generated by an algorithm, which complicates the fight against such practices [1]. The cognitive consequences of students' dependence on artificial intelligence require special attention, since a decrease in the level of independent intellectual activity

leads to deterioration in the skills of logical thinking, argumentation and creative problem solving in the learning process. In the long term, these trends can lead to the formation of a generation of specialists incapable of independent analytical work [7].

At the same time, artificial intelligence has become part of the modern life of students and teachers. Recognizing this fact, it is necessary to develop effective methods for using this technology in professional practice. The application of generative neural networks by educators in the study process might be made more complicated due to insufficient competence of the faculty members in technical area as well as low practical experience, which can be explained by the fact that the average age of an educator both in Russia and Kazakhstan is over 45 years. However, it should be noted that teachers and lecturers have sufficient skills in working with information technology in general and can adopt skills in working with AI, thanks to a simple interface and convenience. Modern research in the field of digital didactics reveals a significant transformation of the homework process under the influence of generative AI systems: there is a stable tendency to minimize the independent cognitive activity of students when preparing academic papers. In the course of an experimental study, it was found that when formulating a written assignment with a detailed problem situation, the degree of automation of the solution using AI reaches 78-92 % (according to monitoring data) [8].

In the context of the educational process, a methodological dilemma arises: the integrative approach involves legitimizing the use of generative neural networks as a tool for primary data collection with mandatory subsequent critical processing and verification of data by the student, while the restrictive approach is based on the development of special types of tasks that are resistant to automated processing. Such tasks may include ones with limited initial information which is lower than the sensitivity threshold of language models. An opposite option is hyper-detailed cases which are above the factual capacities of neural networks when it comes down to interrelated parameters analyses. However, the compilation and verification of these tasks requires the formation of appropriate competencies of teachers. Experimental data demonstrate that modern generative models have such limitations as low reliability of factual verification, since they generate plausible, but actually unreliable information when processing specialized requests, as well as limited relevance of the knowledge base; in most publicly available models, data updating has been discontinued for 2022. In some cases, these limitations create a natural mechanism for teachers to identify automatically generated works. However, it should be taken into account that the dynamics of the development of neural network technologies (according to arXiv.org, 2024) suggests overcoming these limitations in the medium term, which requires the advanced development of new pedagogical strategies for assessing students' independent work.

Modern foreign language didactics has specialized software solutions that have proven their effectiveness in empirical studies. The analysis allows us to classify the most popular platforms into the following functional categories: adaptive learning, audiolingual, modeling languages, and gen-

erative educational systems. Adaptive learning platforms such as Duolingo and Character.ai use dialog agent technology to practice speaking skills with imitation accuracy and provide a 34% increase in vocabulary with regular use (study by Vesselinov & Grego, 2022).

Language modeling systems include Grammarly, Quillbot, DeepL, which provide multilevel text processing, including paraphrase, stylistic adaptation, contextual translation with an accuracy of up to 76 %, designed to automatically improve the text, preserving its meaning and context. Neural networks and natural language processing algorithms are used in the system, offering alternative versions of phrases, sentences and paragraphs, improve the structure of the text, correct grammatical errors and improve literacy (MLA, 2023). Grammarly demonstrates 89 % efficiency in correcting grammatical, punctuation and syntactic errors in writing (study by Dembsey, 2023). The methodological application of Questgen.ai, in particular, confirms its effectiveness in the formation of criterion-oriented tests and the development of cognitive reading strategies. It is possible to use this tool to automate the control of vocabulary acquisition. Speechify, ElevenLabs audio-lingual platforms for converting text to speech use artificial intelligence and natural language processing to convert written text into natural-sounding audio. Thanks to AI technologies, the text reflects natural patterns of human speech, resulting in increased realism, which increases the effectiveness of students' perception of audio texts by 42 % and allows you to create authentic phonetic exercises taking into account 58 dialect variants. These tools can also be used for listening and pronunciation. In addition, educators can boost presentation options by uploading academic materials, texts, lectures, and accompany them with system voices with natural intonation (text-to-speech). This tool is especially convenient for distance learning, since students can listen to the text while simultaneously following its written version, which improves the connection between the graphic and phonetic forms of the word (dual coding effect).

Audio-lingual platforms can be used for pronunciation training with the ability to slow down / speed up speech to adapt the material to the level of students and compare their own pronunciation with the standard. Another promising area of using AI platforms is adaptive reading to support students with dyslexia or other disabilities. Voice-over of texts reduces the cognitive load when reading (study by Logacev et al., 2023). Converting PDF articles to audio format allows you to work through the material outside the classroom, for example, while traveling). Generation of educational dialogues by ElevenLabs using neural network voice synthesis provides opportunities for personalized audio cases. It is possible to upload the dialogue text and select a voice with accent accentuations (British and American English for comparing accents) or generate an authentic conversation and real situations between native speakers on a selected professional topic (psychology, medicine, law, engineering). In foreign language classes, interactive tasks types using generative neural network systems might be based on such tasks as listening and answering questions, generating several versions of one text with changing vocabulary, stylistic features or structure to check understanding. Another option is creation and checking questions in voice format, when a dialogue system with

students answering orally is simulated. These tasks may be especially relevant in preparation for exams (IELTS, TOEFL) when training the Listening section, since it is possible to simulate exam recordings with different voices and speech speeds, as well as a Speaking simulator, in which the examiner's questions are synthesized, the student's answer is recorded and sent to the teacher for checking.

An interesting technique can be the combined use of technologies, such as Speechify and ElevenLabs, for creative projects and preparing test materials. The teacher creates an audio test in ElevenLabs (for example, a lecture with «errors»), students mark inaccuracies using the transcription in Speechify. These technologies allow you to personalize learning to the level of the group, create authentic materials without searching for native speakers, and automate routine tasks of generating and checking materials. The use of AI speeds up the creation of educational text material, the teacher independently writes one text, and AI will create several texts based on the proposed sample or structure. Models for paraphrasing text material can be used to increase students' vocabulary [11].

A promising direction is the integration of these platforms into blended learning models, which is confirmed by OECD research (2023) on a 28 % increase in the effectiveness of the educational process with a competent combination of digital and traditional methods [8]. However, when teaching AI, tools can only serve as a supplement to traditional methods, including live discussions and written work. To minimize negative consequences, it is necessary to adapt educational approaches. A possible solution would be to move from reproductive tasks, such as essays and summaries, to tasks that require critical thinking and personal interpretation of students' material. It is also necessary to work on forming a conscious attitude towards technology in students, emphasizing the importance of independent work, which will be supported by the introduction of effective proctoring systems capable of monitoring the use of AI.

Conclusion. The integration of artificial intelligence into the educational process, especially in linguistics, is an objective and irreversible trend that carries both significant didactic potential and significant risks for the development of critical competencies. Although AI and generative neural networks provide powerful tools for optimizing learning, its incorrect use threatens academic integrity and reduces the quality of education. To maintain a balance between technological progress and the intellectual development of students, a systematic approach is needed that combines pedagogical innovations with increased control over the independence of work. The current stage of development of educational technologies is characterized by a temporary «window of opportunity» when the natural limitations of AI systems in general and generative neural networks in particular allow maintaining the effectiveness of traditional control methods, but already require the development of fundamentally new approaches to the design of educational tasks in the context of total digitalization of cognitive processes. The conducted study allows to conclude that the use of artificial intelligence in the educational process is characterized by dialectical duality: on the one hand, de-

spite the obvious benefits of automating routine processes, serious risks arise: algorithms operating on incomplete data and according to unclear rules create a security threat in a legal vacuum (prevention of professional burnout of teachers), the possibility of adaptive learning and the generation of educational content. To minimize the negative consequences and optimize the integration of AI technologies into educational practice, it is necessary to develop new assessment forms resistant to automated processing. Secondly, systematical improvement of digital competences of the faculty members should be organized using further education courses covering functional limitations of AI systems, architectural features and generative neural networks. Thirdly, purposefully use the technological capabilities of AI to create high-quality didactic materials and personalize the process of teaching foreign languages, which in the long term will contribute to the professional development of teachers and increase the effectiveness of the educational process in higher education.

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