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URGENT PROBLEMS OF MODERN SOCIETY

ARTIFICIAL INTELLIGENCE: THREAT OR OPPORTUNITY

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LEGAL RESPONSIBILITY FOR CYBERCRIME UNDER THE LEGISLATION OF THE RUSSIAN FEDERATION

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Abstract. The article is devoted to the study of current problems of legal responsibility for cybercrime in the Russian Federation. The theoretical approaches to defining the concept and essence of cybercrime are analyzed, a review of the current criminal legislation is conducted, the need for a comprehensive approach including the intensification of preventive work is substantiated.

Keywords: cybercrime; legal liability; information security; cybersecurity; digital rights.

ЮРИДИЧЕСКАЯ ОТВЕТСТВЕННОСТЬ ЗА КИБЕРПРЕСТУПНОСТЬ ПО ЗАКОНОДАТЕЛЬСТВУ РОССИЙСКОЙ ФЕДЕРАЦИИ

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Аннотация. Статья посвящена исследованию актуальных проблем юридической ответственности за киберпреступность в Российской Федерации. В статье обосновывается необходимость комплексного подхода, включающего не только модернизацию законодательства, но и активизацию профилактической работы и повышение квалификации правоохранительных органов.

Ключевые слова: киберпреступность; юридическая ответственность; информационная безопасность; кибербезопасность; цифровые права.

Introduction

The twenty-first century can rightfully be called the era of information technology. Computers, smartphones, and other electronic devices have become an integral part of everyday life, business, and public administration. However, the rapid development of the digital environment is also accompanied by an increase in new types of criminal activities. Cybercrime, as a complex and multifaceted phenomenon, is currently one of the most rapidly evolving threats that requires an adequate legal response.

The relevance of the research topic is, firstly, due to the high growth rate of cybercrimes in Russia (the number of cybercrimes has increased more than fivefold over the past five years), secondly, to the high latency of this category of offenses and finally, to the existence of significant gaps and contradictions in legal regulation and law enforcement practice. The scientific problem highlights the necessity to ensure a balance between the effective prosecution of cybercriminals and the protection of the rights of the accused, as well as in solving complex issues related to the formation of evidence in this category of cases [1].

Theoretical framework

The term "cybercrime" is not legally defined in Russian criminal legislation, which leads to numerous discussions in the scientific community and difficulties in law enforcement. An analysis of scientific literature allows us to define cybercrime as a set of crimes committed in the field of information and telecommunication technologies, in the so-called virtual space. As researchers (E.V. Nikulchenkova, P.N. Kobets) point out, the lack of a unified definition makes it difficult to develop unified approaches to the qualification of these acts and their prevention [2].

The most common types of cybercrimes today are internet-based fraud, the distribution of malicious software, unauthorized access to computer information, and new forms such as phishing, cyberbullying, and cyberterrorism. Of particular concern is the fact that the cybercrime community is becoming increasingly organized [3].

The basis of legal regulation of liability for cybercrimes in the Russian Federation is Chapter 28 of the Criminal Code of the Russian Federation "Crimes in the field of computer information". It includes Articles 272 (unauthorized access to computer information), 273 (creation, use and distribution of malicious programs), 274 (violation of the rules for the operation of means of storage, processing or transmission of computer information) and 274.1 (unauthorized impact on critical information infrastructure).

Despite the presence of specialized norms, law enforcement practice faces a number of serious problems. Firstly, the wording is insufficiently thought-out and vague, which leads to errors in the classification of crimes. Secondly, the provisions of Chapter 28 are not exhaustive: many acts committed using IT-technologies fall under other articles of the Criminal Code of the Russian Federation (for example, fraud under Article 159), which creates complex situations for investigative bodies.

Thirdly, legislation cannot keep up with the rapid development of technology: the use of cryptocurrencies, anonymous networks, and artificial intelligence significantly complicates the investigation process and requires constant adaptation of legal norms [4].

Methods and results

There are several approaches to the classification of cybercrimes in the scientific literature. The most reasonable approach is to divide them based on the object of the crime and the method of its commission. In this study, we identify three main groups of cybercrimes:

1. Cybercrimes that target the confidentiality, integrity, and accessibility of computer information. These include unauthorized access, the creation and distribution of malware, phishing, and cyberterrorism. These actions aim to undermine information security and can cause harm to individuals and the state as a whole.

2. Crimes related to the distribution of prohibited items and substances. With the increasing availability of anonymous Internet sites (the dark web), there has been an increase in crimes related to the illicit trafficking of drugs, weapons, and other prohibited items, which are committed using information and telecommunication networks.

3. Crimes against the individual and public morality. This group includes cyberbullying, the distribution of pornographic materials (especially involving minors), defamation, and other acts that infringe upon the honor, dignity, and mental well-being of citizens.

This classification allows us not only to better understand the scale of the problem, but also to develop differentiated countermeasures [5].

An analysis of law enforcement practice and scientific literature allows us to conclude that the existing system of criminal liability for cybercrimes is insufficiently effective. The key problems are:

1. Low detection rates. The latency of cybercrimes remains at a critically high level. Many victims do not contact law enforcement agencies, or their statements do not lead to the initiation of criminal cases due to the difficulty of identifying the individuals involved in the crime.

2. Lack of qualified personnel. Investigating cybercrimes requires specific knowledge of information technology, which is not always available to all investigators.

3. Difficulties with the evidence base. Electronic evidence is fragile and subject to falsification. The lack of unified standards for collecting, recording, and evaluating it leads to the loss of legal force of the collected materials.

4. Inadequacy of the legislation. As already mentioned, the provisions of Chapter 28 of the Criminal Code of the Russian Federation do not always allow for an adequate qualification of acts committed using new technologies (for example, attacks using artificial intelligence or cryptocurrency schemes).

According to researchers (A.A. Zharkova and D.V. Puchkov), the existing legislation is often inflexible, which prevents law enforcement agencies from

responding quickly to new challenges. This problem becomes particularly acute in the context of the threat of cyberterrorism, which requires special measures to counter it [6].

As part of the work, a sociological study (questionnaire survey) was conducted among residents of the city of Kaliningrad in order to identify the level of awareness of citizens about cybercrime and their assessment of the effectiveness of legal liability measures. 52 respondents participated in the survey.

The results of the study showed:

1. Awareness: 77% (40 people) of the respondents are familiar with the concept of "cybercrime." The most well-known types of crimes are "Internet Fraud," "Viruses," and "Account Hacking." However, only 17% (9 people) are familiar with Phishing, which indicates a lack of awareness about the most dangerous methods of social engineering.

2. Victimization: 46% (24 people) of the respondents have personally experienced cybercrime, confirming the high prevalence of this threat.

3. Legal awareness: 94% (49 people) are aware of the legal responsibility for such actions. However, there is a difference in understanding the type of responsibility: 48% (25 people) indicated criminal liability, 29% (15 people) indicated administrative liability, and 15% (8 people) indicated civil liability, indicating some confusion in the legal awareness of citizens.

4. Assessment of effectiveness: Most respondents rated the effectiveness of existing measures as "average" (3 out of 5). The "1" and "2" ratings received the same number of votes as the "4" rating, indicating a polarized opinion and a lack of confidence in the effectiveness of government policies in this area.

5. Responsibility for protection: 40% (21 respondents) believe that users themselves are primarily responsible for their own protection. Only 17% (9 respondents) place this responsibility on the government.

6. Sources of information: The main sources of information about cybersecurity are social networks (40 responses) and news (32 responses). The role of law enforcement agencies in educating the public is minimal (only 4 responses).

The survey data confirms the theoretical findings: despite the awareness of the threat, the public is not sufficiently informed about current risks and ways to protect themselves. The shift of responsibility to users themselves, coupled with low legal and digital literacy, is a contributing factor to the rise of cybercrime.

Conclusion

The conducted research allows us to conclude that cybercrime is a complex and dynamically developing threat that requires an effective response that goes beyond purely legal measures.

An analysis of the current legislation and law enforcement practices revealed the following shortcomings: the absence of a legal definition of "cybercrime" in the Criminal Code of the Russian Federation, the inadequacy and inflexibility of existing

regulations, the low detection rate and high latency of crimes, as well as the insufficient qualifications of law enforcement personnel.

The results of the sociological survey demonstrated the urgent need to intensify preventive work, especially among young people, and to increase the level of legal literacy of the population in matters of digital hygiene.

Only the implementation of a set of legislative, organizational, and preventive measures will allow us to create an effective system of protection against cyber threats and ensure reliable legal responsibility for cybercrimes in the digital age.

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CONTRASTIVE CHARACTERISTICS OF FRAUD AS A SPECIFIC TYPE OF CYBERCRIME USING ARTIFICIAL INTELLIGENCE TECHNOLOGIES (BASED ON ENGLISH, FRENCH AND RUSSIAN MESSAGES)

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Abstract. The article analyzes fraud messages as manipulative discourse using contrastive analysis of English, French and Russian languages. It identifies universal, frequent and unique characteristics. Special attention is given to the role of artificial intelligence in generating and detecting fraud.

Keywords: fraud discourse; contrastive analysis; manipulation; artificial intelligence.

КОНТРАСТИВНЫЕ ХАРАКТЕРИСТИКИ ФРОДА КАК ОСОБОГО ВИДА МЕЖДУНАРОДНОЙ КИБЕРПРЕСТУПНОСТИ В КОНТЕКСТЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА (НА МАТЕРИАЛЕ АНГЛИЙСКИХ, ФРАНЦУЗСКИХ И РУССКИХ СООБЩЕНИЙ)

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Аннотация. В статье анализируются мошеннические сообщения как манипулятивный дискурс с использованием контрастивного анализа английского, французского и русского языков. Выявляются универсальные, частотные и уникальные характеристики. Особое внимание уделяется роли искусственного интеллекта в создании и выявлении мошенничества.

Ключевые слова: фрод-дискурс; контрастивный анализ; манипуляция искусственный интеллект.

Introduction

In the context of digital globalization fraud has become one of the most widespread types of international cybercrime in the field of information technology. Fraud messages are everywhere. They use different languages and platforms to deceive more people. Even though they change for each group and usually follow the same

patterns. At the same time, artificial intelligence (AI) has significantly transformed both the production and detection of such messages. This makes it necessary to analyze fraud discourse not only from a psychological or technical perspective, but also from a linguistic one. The aim of this study is to identify contrastive characteristics of fraud messages in three different languages, English, French and Russian, in the context of AI.

Theoretical framework

Fraud discourse is a type of manipulative communication where the sender influences the recipient without revealing their real intention [3]. One of the most effective approaches to studying such discourse is contrastive analysis which allows researchers to compare languages and identify similarities and differences between them [1].

A key concept in this approach is interlingual correspondence. In fraud discourse linear correspondences can be observed in examples such as «account» – «compte» – «аккаунт». However, vector correspondences are also common. For example, the English term «scam» has multiple equivalents in Russian and French such as «мошенничество», «афера», «arnaque». In addition to these variations, the presence of lexical lacunae is another important aspect of this analysis. For example, the term «phishing» has no full equivalent in Russian and is typically borrowed as «фишинг». Similarly, the English term «money mule» does not have a direct equivalent and is usually translated descriptively. These gaps show that these concepts reflect cultural and linguistic differences [1].

Fraud messages can be analyzed on several levels, including lexical, grammatical, pragmatic and discursive. This multi-level approach makes it possible to identify universal, frequent and unique characteristics of fraud communication [2].

Methods and results

The analysis is based on smishing messages in English, French and Russian and examined on contextual, linguopragmatic, cognitive and interpretative levels.

(1) *POSTAL SERVICE. DELIVERY FAILURE NOTIFICATION. Due to a lack of complete address information we **have been unable** to deliver your parcel 170076433251997* [6].

The contextual analysis shows that the purpose of this message is to take action according to delivery notification. It pretends to be a postal service and gives a tracking number. **The linguopragmatic analysis** demonstrates using formal language and capital letters to look official (“*POSTAL SERVICE*”). **The cognitive-discursive analysis** reveals a delivery problem, making the potential victim believe the parcel is real and using urgency makers (“*failed to deliver*”). **The evaluative analysis** illustrates the psychological effect of this message based on anxiety and moderate manipulation.

(2) *FreeMsg: Chase Sapphire Fraud Dept. Did you attempt \$887.60 at Walmart Super Center BAL with card Xxxxxx?*[7]

This message demonstrates a different strategy. **The contextual analysis** shows that the aim of this message is potential data disclosure. It also relies on bank identification and specific transaction amount. **The linguopragmatic analysis** establishes using formal register and numerical precision to enhance credibility (“*Fraud Dept*”, \$887.60). **The cognitive-discursive analysis** shows a potential fraud scenario, presupposition of transaction and the need for urgent response (“*Did you attempt...?*”). **The evaluative analysis** reflects a high degree of manipulation and implicit pressure to act immediately.

(3) *ASSURANCE MALADIE : Votre nouvelle carte vitale est disponible. Remplissez ce formulaire afin de rester couvert : <https://cpam-contact.fr>* [5].

On the other hand, French messages tend to rely on politeness and institutional tone. The aim of this message according to **the contextual analysis** is to make the user follow a malicious link and share personal data referring cues (“*carte vitals*”). **The linguopragmatic analysis** demonstrates concise formal style (“*Votre nouvelle carte vitale est disponible*”). **The cognitive-discursive analysis** indicates that the card is real. **The evaluative analysis** establishes that the psychological effect is anxiety and curiosity based on low manipulation.

(4) *Chronopost : une erreur est survenue lors de la livraison de votre colis cliquez ici pour acheminer votre colis :<https://chronopost-interruption.com>* [5].

The contextual analysis shows that the aim is to drive link-clicking and data entry. **The linguopragmatic analysis** reveals using a brief, neutral tone with directives (“*cliquez ici*”). **The cognitive-discursive analysis** presents a delivery issue. **The evaluative analysis** reflects moderate manipulation.

(5) *ЕСМС 20/09/2018 12:25:59. Оплата покупки с **Вашей** банковской карты на сумму **13390 RUB** выполнена успешно/ **OZON.RU**. Платёж **будет выполнен** в течение суток. Если **Вы** не совершали данный платеж, просьба обратиться в отдел финансовой безопасности банка **по телефону: +7 (499)*** [4].

The contextual analysis unveils that the aim of the message is possible data disclosure and it relies on a real brand, exact money and timestamp. **The linguopragmatic analysis** shows using formal and concise style with standard banking phrasing, passive construction (“*платеж будет выполнен*»). **The cognitive-discursive analysis** indicates that the transaction is real. **The evaluative analysis** shows high manipulation.

(6) *Начислена сумма за предоставленные услуги. **Просим** произвести оплату до **27 марта** включительно. **В противном случае** начисляется неустойка в **размере 10%** от суммы задолженности. По всем вопросам обращайтесь в службу поддержки по ссылке* [8].

The aim of this message according to **the contextual analysis** is to make the user pay a fake bill. It relies on legal terms and a deadline. **The linguopragmatic analysis** indicates using polite imperatives (“*просим произвести оплату*”). **The cognitive analysis** shows that the service was provided. **The evaluative analysis** demonstrates that the psychological effect is based on a panic and high manipulation.

The comparison of these examples shows clear universal characteristics. All messages use similar structures, including problem, instruction and consequence. Imperatives and modal meanings are present in all languages, as in “Click”, “Cliquez” and “обратиться”. Semantic fields such as security, payment and urgency are also universal.

At the same time, frequent characteristics differ. English messages are short and neutral, Russian fraud messages are emotional and detailed, while French ones are formal and polite. This comes from the cultural and linguistic characteristics in each language.

These differences show that there isn’t always a direct match between languages. For instance, English terms like “tracking number” and “Fraud Dept” don’t translate exactly into Russian or French. At the same time, Russian terms like “неустойка” and “отдел финансовой безопасности” have specific legal meanings that aren’t found in English and French. Examples such as “carte vitale” and the phrase “une erreur est survenue” are have no direct analogues in English or Russian (see Table 1).

Artificial intelligence significantly plays a crucial role in these processes. For example, it can generate fraud messages that reproduce universal, frequent and unique characteristics of each language. For example, they can produce short and natural English messages, formal French texts and emotionally intense Russian messages. AI identifies patterns such as urgency markers, imperative constructions and discourse structures. However, without contrastive analysis, such tools like AI need to understand and recognize specific features of each language to be effective.

Table 1

Contrastive characteristics of fraud discourse

Type	English	French	Russian
Universal	Contextual (target, urges click), linguopragmatic (imperatives), cognitive-discourse (problem-instruction-consequence), interpretative (informing). AI signs – overly consistent phrasing, lack of small human errors, repetitive emotional triggers, unusually neutral politeness.		
Frequent	Contextual (short, neutral and polite messages); linguopragmatic (assertives, concise, capitalized headlines); cognitive-discursive (framing delivery/transaction); interpretative (moderate manipulation).		Contextual (detailed, emotional); linguopragmatic (passive constructions, formal polite); cognitive-discursive (framing payment); interpretative (high manipulation).

Type	English	French	Russian
Unique	Contextual (“tracking number”); linguopragmatic (Fraud Dept); cognitive-discursive (presupposition of specific US institutions); interpretative (anxiety based on authority).	Contextual (administrative context); linguopragmatic (“une erreur est survenue”); cognitive-discursive (presupposition of French healthcare/delivery system); interpretative (concern, low-moderate manipulation).	Contextual (financial/legal context); linguopragmatic (“отдел финансовой безопасности”); cognitive-discursive (presupposition of Russian banking/legal system); interpretative (fear, coercion).

Conclusion

Our study of English, French and Russian fraud messages shows that while scammers use the same basic strategies, the way they write depends on language and culture. Universal characteristics ensure the effectiveness of fraud communication, while frequent and unique features reflect specific strategies. In the context of artificial intelligence, these differences become especially important, as they influence both the generation and detection of fraud messages. AI-generated messages often show perfect grammar, repetitive structures and literal use of unique terms which can help in detection and analysis of automated fraud. Thus, contrastive analysis is essential for understanding fraud discourse and improving AI-based systems for its identification and prevention.

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ARTIFICIAL INTELLIGENCE AS A CHANGE DRIVER IN INSURANCE RISK ASSESSMENT

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Abstract. The article examines the use of Big Data, telematics, and generative AI to improve risk forecasting and pricing in insurance. Case studies show reduced errors and increased automation. Results highlight higher efficiency and emerging regulatory challenges.

Keywords: artificial intelligence; actuarial calculations; Big Data; generative AI; socio-technological progress.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАК ДРАЙВЕР ИЗМЕНЕНИЙ В ОЦЕНКЕ РИСКОВ В СТРАХОВАНИИ

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Аннотация. Статья рассматривает использование Big Data, телематики и генеративного ИИ для улучшения прогнозирования рисков и ценообразования в страховании. Кейсы показывают снижение ошибок и рост автоматизации. Результаты отражают повышение эффективности и появление регуляторных вызовов.

Ключевые слова: искусственный интеллект; актуарные расчёты; Big Data; генеративный ИИ; социально-технологический прогресс.

Introduction

In recent decades, the insurance industry has been undergoing significant transformation driven by technological progress and the increasing complexity of economic and social processes. The need for more accurate and timely risk assessment has become especially important in an environment characterized by uncertainty and rapidly changing data.

Within this context, actuaries play a central role. They are specialists who apply mathematical and statistical methods to evaluate risk and uncertainty, primarily in insurance and pension systems. Their work is closely linked to the functioning of insurance markets, as they calculate premiums, estimate future liabilities, and help ensure the long-term financial stability of insurance companies. Accordingly, actuarial calculations form the basis of financial stability in insurance systems and corporate pension programs, as they support the assessment of lasting obligations, the formation of reserves, and informed risk management decisions.

Traditionally, these calculations rely on relatively stable demographic, financial, behavioral, and regulatory factors derived from historical data [1]. However, in the context of rapid digitalization and increasing economic uncertainty, the adequacy of traditional actuarial approaches is being questioned. The growing volume, heterogeneity, and velocity of data, as well as structural shifts in risk patterns, require more flexible and adaptive analytical tools. In this regard, artificial intelligence (AI) is not merely an additional instrument, but a factor that fundamentally transforms the logic of actuarial modeling.

Unlike classical statistical methods, AI enables the integration of structured and unstructured data, real-time processing, and the identification of nonlinear dependencies that are difficult to capture within traditional actuarial frameworks. At the same time, the introduction of AI raises a number of methodological and socio-economic issues, such as model interpretability, data bias, and regulatory compliance.

The purpose of this study is to examine the transformation of actuarial calculation factors under the influence of AI, with an emphasis not only on technological advantages but also on emerging limitations and risks.

The objectives include systematizing traditional actuarial factors; analyzing the impact of AI and Big Data technologies; identifying key directions of transformation; and assessing the socio-technological consequences for the insurance market. The study is based on a review of Russian and international literature, including both classical actuarial works [1; 2] and recent studies dated 2019–2026.

Theoretical framework

The formation of actuarial calculation factors historically relied on stable statistical regularities. Early contributions by J. Graunt, E. Halley, and J. de Witt laid the foundation for mortality modeling and discounting approaches that remain relevant in modified forms today [1; 2]. These models assume a certain degree of stationarity in demographic and financial processes.

Modern actuarial practice, however, is increasingly confronted with situations in which data lose their stability: demographic behavior evolves, financial markets become more volatile, and client behavior shaped by digital environments. Thus, the traditional assumption of stability becomes a limiting factor rather than an advantage.

In this context, AI-based approaches shift the paradigm from static estimation to dynamic prediction. For example, instead of relying solely on aggregated mortality tables, insurers incorporate real-time behavioral and environmental data (telematics, IoT), allowing for more granular risk segmentation [5]. However, such segmentation raises concerns regarding fairness and potential discrimination, as noted in [9].

Furthermore, generative AI expands actuarial analysis beyond numerical datasets by enabling the extraction of relevant features from unstructured sources such as claim descriptions, medical reports, and market documents [8]. This significantly broadens the informational base of actuarial models, but also introduces new risks related to data quality and the reproducibility of results.

Therefore, the transformation of actuarial factors under AI should be interpreted not only as a technological improvement, but as a shift in the epistemological foundations of actuarial science.

Methods and results

The research methodology is a systematic review analysis of scientific sources and current publications from 2019–2026, with the results are documented below.

The conducted review demonstrates that the integration of AI into actuarial practice leads to a qualitative transformation of key calculation factors. However, this transformation is not uniform and should be assessed analytically (see Table 1).

The most significant results come from generative AI applications. The review of four implemented case studies (Hatzesberger & Nonneman, arXiv, 2025) demonstrates practical outcomes (see Table 2).

These tables summarize the basic findings: AI shifts actuarial calculations from static, limited-data models to dynamic, data-rich systems. In Russian practice, Big Data and telematics [5] already enable personalized motor and medical insurance products, while AI in underwriting and pricing [6] reduces fraud (up to 18 % of losses) and expands client coverage. Generally, the review confirms improved accuracy, speed, and personalization, directly contributing to socio-technological progress.

At the same time, the identified improvements should be treated with caution. First, the transition to data-rich models increases dependence on data quality and availability, which may differ considerably across insurers. Incomplete or biased datasets can distort risk assessments and reduce the reliability of actuarial conclusions.

Table 1

**Transformation of Actuarial Calculation Factors:
Traditional vs. AI-Enhanced Approach**

Factor type	Traditional approach (static)	AI-enhanced approach (dynamic)	Key benefits (sources)
Demographic	Fixed mortality tables, population statistics	Real-time Big Data and telematics analysis	Higher accuracy, personalization [5; 1]
Behavioral	Limited historical data	Behavioral patterns from IoT and user data	Risk prediction based on actual behavior [6]
Financial	Statistical models and fixed discount rates	Generative AI feature extraction from unstructured text	Reduced prediction errors, dynamic pricing [8; 7]
Regulatory	Manual compliance checks	Automated compliance and personalized product design	Increased accessibility and market sustainability [5; 4]

Table 2

Key Generative AI Case Studies in Actuarial Work

Case study	Technology used	Main result	Socio-technological impact
Claims cost prediction	Large Language Models (LLMs)	Significant reduction in prediction errors from unstructured text	Faster and more accurate loss forecasting
Market comparisons	Retrieval-Augmented Generation (RAG)	Automated processing of insurer reports	Improved decision-making speed
Car damage classification	Vision-enabled LLMs	Accurate damage type identification and context extraction	Streamlined claims processing
Autonomous data analysis	Multi-agent systems	Automatic report generation from datasets	Reduced manual workload, higher efficiency

Second, the expansion of behavioral and telematics data introduces a growing asymmetry of information between insurers and policyholders. While this enhances pricing precision, it may also lead to excessive risk segmentation and reduced accessibility of insurance products for certain groups, potentially conflicting with the social role of insurance.

Third, the use of generative AI technologies [8] in actuarial tasks, particularly in processing unstructured data, raises issues of model interpretability and regulatory compliance. In highly regulated environments, limited transparency of AI models may constrain their practical implementation despite demonstrated efficiency gains.

The transformation of actuarial calculations under AI should be understood as a complex trade-off between accuracy, efficiency, transparency, and fairness, rather than as a purely positive technological alteration.

Conclusion

The analysis shows that artificial intelligence transforms actuarial calculations from static models into dynamic, data-driven systems, improving their accuracy and responsiveness.

At the same time, this transformation is ambivalent: alongside efficiency gains, it introduces challenges related to data quality, model transparency, regulatory compliance, and potential inequality in access to insurance.

The integration of AI should be viewed not only as technological progress, but as a broader institutional shift requiring new standards and regulatory approaches. For the Russian insurance market, its effectiveness is likely to depend on balancing innovation with regulation, with further research focusing on empirical validation and durable socio-economic effects.

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HUMAN VS AI IN PORTFOLIO MANAGEMENT: WHO EXECUTES BETTER ON THE MOSCOW EXCHANGE?

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Abstract. The paper compares AI-driven and traditional portfolio strategies on the Moscow Exchange during 2025 according to risk-adjusted performance metrics to assess whether AI approaches overtake human decision-making. The results reveal traditional strategies make better, suggesting that AI does not regularly outperform in the Russian market.

Keywords: artificial intelligence; portfolio management; machine learning; retail investors; asset allocation.

ЧЕЛОВЕК ПРОТИВ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В УПРАВЛЕНИИ ПОРТФЕЛЕМ: КТО ДЕЙСТВУЕТ ЭФФЕКТИВНЕЕ НА МОСКОВСКОЙ БИРЖЕ?

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Аннотация. В статье сравниваются стратегии управления портфелем на основе ИИ и традиционные подходы на Московской бирже в 2025 году по показателям, учитывающим риск, чтобы оценить, превосходит ли ИИ человека в принятии инвестиционных решений. Результаты показывают, что традиционные стратегии работают лучше, свидетельствуя, что ИИ не обеспечивает стабильного преимущества на российском рынке.

Ключевые слова: искусственный интеллект; портфельное управление; машинное обучение; розничные инвесторы; распределение активов.

Introduction

The rapid growth of retail investment in Russia has dramatically increased the demand for effective portfolio management tools. In 2025, the number of private investors with brokerage accounts on the Moscow Exchange (MOEX) rose by 5 million to 40,1 million, with a total of 76 million accounts opened (+11,7 million during the year) [8]. Moreover, private investors accounted for 70,7% of equity trading volume and 31,3% of bond trading volume [8].

With portfolio management requiring investors to possess strong financial expertise and deep market insights due to the complexity of balancing risk and reward through optimal asset allocation, this process remains challenging. Artificial intelligence (AI) and is expected to address the shortcomings and limitations of classical portfolio construction techniques [10]. In spite of the extensive academic literature growth, the mainstream of empirical studies focuses only on US, European, or East Asian equity markets [10]. This paper directly addresses the gap by comparing human-analyst and machine-learning-guided portfolios on MOEX over 2025.

Thus, the motivation for current research is threefold: **1)** the structural shift toward retail dominance creates sentiment-driven volatility that tests AI adaptability; **2)** emerging-market challenges (liquidity shifts, geopolitical shocks) question the applicability of global AI findings; **3)** no prior academic work has compared human and AI portfolios on Russian data using the full suite of risk-adjusted metrics (return, volatility, Sharpe ratio, Sortino ratio, VaR)

The basic research problem is the following: can ML techniques construct a portfolio that matches or exceeds the risk-adjusted performance of a human investor under the

same asset constraints? This question has direct implications for retail investors, democratization of financial advice, and regulatory oversight in Russia.

However, despite the growing popularity and promising capabilities of AI in portfolio management, it is not without significant limitations: overfitting, “black-box” opacity, strategy convergence, and collective vulnerability to shocks are widely discussed in recent literature.

Theoretical framework

Classical Approaches to portfolio management

Strategies of portfolio management can be classified according to the rebalancing principle into *passive strategy* (“*Buy and hold*”), when investor once molds portfolio and then makes almost no transactions and *strategic asset allocation*, including Harry Markowitz's mean-variance optimisation (MVO) and fixed-weight strategy [1]. Popular fixed-weight approaches include 80/20 and 60/40 equity-bond splits, equal-weight, permanent, and All-Weather portfolios [1]. MVO has some limitations: sensitivity to input errors, assumption of normal returns, and neglect of higher moments [7].

Alternative approaches to portfolio management

Machine learning enhances optimisation through deep learning (LSTM, CNN) and reinforcement learning (RL), which capture non-linear patterns and enable dynamic rebalancing [9], [11]. Robo-advisors automate advice and reduce behavioural biases at low cost, yet remain limited by historical data dependence and adaptability issues in emerging markets [4].

Hybrid approaches that combine AI forecasting with classical optimisation show the best results by mitigating pure-AI risks [6]. Nevertheless, critical studies highlight persistent problems: overfitting, lack of transparency, and systemic risks from strategy convergence [5].

Based on the theoretical framework and the review of existing literature, we advance the following hypotheses:

H1 (Performance): The AI-advised portfolio will achieve a statistically higher Sharpe and Sortino ratio than the human-constructed portfolio over the observation period.

H2 (Downside Risk): The AI-advised portfolio will exhibit lower maximum drawdown and lower 95% VaR during periods of elevated market volatility, reflecting the risk-averse calibration.

Methods and results

Methods

The amount of simulated portfolios will be 1 million rubles. In this research, it is supposed to simulate three portfolios with different strategies of allocation: AI-managed portfolio, a portfolio with a “buy and hold” strategy and a rebalanced quarterly portfolio with 80/20 allocation with adding long-duration government bonds.

The AI-driven portfolio is going to be approximated with Alfa-Capital, asset management company, fund “Quantum” which is managed by AI. Fundamental technologies underlying the AI-model are machine learning models using decision trees. Such methods provide a forecast of asset allocation with a wide diversity of information including digitalized financial reports and market trend signals. Transactions are carried out according to the signals of an algorithm that analyzes mainly the stock market of Russian companies in search of securities with growth potential on the horizon of several weeks or days [2]. The resource of data for the observation window December, 31st 2024 to December, 31st 2025 is InvestFunds where the daily quotes of shares of “Quantum” are collected.

To ensure the purity of the experiment, traditional portfolios are supposed to be filled with the same assets as in the Alfa Capital fund "Quantum" TOP-5 assets, namely: Sberbank of Russia, Yandex, T-technologies, MTC, Transneft, Gazprom, [3]. Daily closing price data for the same observation period is sourced from the Moscow Exchange.

The performance of all constructed portfolios is going to be evaluated using five metrics: 1-year return ratio, volatility, Sharpe ratio, Sortino ratio, value at risk (VaR). These metrics were selected to provide a comprehensive evaluation of both return and risk. Annual return and volatility represent the fundamental measures of performance and overall risk. The Sharpe ratio was included to measure excess return per unit of total risk. The Sortino ratio was added as a complement because it focuses exclusively on downside volatility, offering a more precise assessment of harmful risk. Finally, the 95% Value at Risk (VaR) was incorporated to quantify potential tail losses, providing insight into the portfolios’ exposure to extreme market downturns under normal market conditions.

Results and interpretation

The “buy and hold” portfolio yielded an annual return of 9,3% with an annualised volatility of 25,9%, producing a Sharpe ratio of $-0,3$ and a Sortino ratio of $-0,43$, with a daily VaR of $-2,2\%$ (see Table 1). The 80/20 rebalanced portfolio demonstrated the strongest risk-adjusted performance across all metrics, delivering a return of 11,1% at a considerably lower volatility of 21,1%, a Sharpe ratio of $-0,29$, a Sortino ratio of -0.40 , and the smallest daily loss at risk of $-1,74\%$.

AI-managed fund "Quantum", by contrast, generated a near-zero annual return of 0.49% regardless of maintaining a volatility level comparable to the 80/20 portfolio (21,4%), resulting in the weakest Sharpe ratio of $-0,7$ and Sortino ratio of -1.06 , with a VaR of $-1,97\%$.

The results indicate that none of the three strategies generated returns sufficient to exceed the risk-free rate over the observation period, which is reflected in the universally negative Sharpe and Sortino ratios. Nevertheless, meaningful differences in performance were observed across the portfolios. The 80/20 allocation strategy outperformed both alternatives in terms of return, downside risk management,

and tail risk, signifying that systematic rebalancing and moderate fixed-income exposure provided a degree of resilience in the volatile Russian equity market of 2025.

Table 1

Comparison of portfolio strategies

Metrics	Buy and hold	80/20	Quantum
Return ratio,%	9,32%	11,06%	0,49%
Year volatility,%	25,91%	21,14%	21,36%
Sharpe ratio	-0,29	-0,28	-0,77
Sortino ratio	-0,43	-0,41	-1,05
VaR 95%,	-2,17%	-1,74%	-1,97%

The underperformance of the AI-managed fund is particularly noteworthy given its comparable volatility profile. The fund absorbed similar levels of market risk while failing to translate that exposure into meaningful returns, which raises questions about practical effectiveness of algorithmic management under specific structural conditions of the Moscow Exchange during the observed period.

Conclusion

This study contributes to the growing body of literature on AI-driven portfolio management by providing empirical evidence from the Russian financial market, which remains underexplored in academic research. The findings were expected to demonstrate that while AI-based approaches offer significant advantages in terms of data processing, adaptability, and scalability, they do not universally outperform traditional investment strategies when evaluated on a risk-adjusted basis. Regulators and retail investors should approach fully automated robo-advisory with caution until explainability and robustness improve. Future research should extend the horizon, including transaction costs, and AI-model proper for Russian market development.

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A LITERATURE REVIEW ON ARTIFICIAL INTELLIGENCE PHENOMENON IN AGENT-BASED MODELLING: COMPARATIVE ANALYSIS

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Abstract. Main applications of artificial intelligence in science include analyzing data and creating models of different complex systems. One of the examples of such usage is agent-based modelling. The paper examines different existing approaches and reasons to the use of artificial intelligence in agent-based modelling.

Keywords: agent-based models; large language models; artificial intelligence.

ЛИТЕРАТУРНЫЙ ОБЗОР ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В АГЕНТНО-ОРИЕНТИРОВАННОМ МОДЕЛИРОВАНИИ: СРАВНИТЕЛЬНЫЙ АНАЛИЗ

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Аннотация. Одним из примеров использования ИИ в науке является агентно-ориентированное моделирование. В статье исследуются существующие подходы к использованию ИИ в агентно-ориентированном моделировании и причины такого использования.

Ключевые слова: агентно-ориентированные модели; большие языковые модели; искусственный интеллект.

Introduction

Recent developments in artificial intelligence (AI), such as large language models (LLMs) or deep learning models pave a way for advancements in different scientific fields. An example of direct influence of AI is its usage in research. For example, to predict indicators through creating models with AI implemented in them. Agent-based modelling is a type of modelling that is gaining popularity nowadays because of its dependency from both hardware and software. Logically, researchers try to use AI in agent-based modelling too.

Theoretical framework

Agent-based models are an efficient tool for exploring complex systems in different fields of science. They imitate behaviour of individual agents inside of an environment, where they also interact with each other, with the environment and interactions are regulated by a set of specific rules. Researchers specify several crucial capabilities of agents [6]:

1. Autonomy – no human intervention should be needed for agents to operate.
2. Reactivity – agents should be able to perceive the existing environment of a model and respond to changes in it.
3. Social ability – agents should be able to interact with other agents which exist in a model.
4. Pro-activeness – agents should be able not only react to the changes in the environment, but to take the initiative in order to reach a certain goal.

Large language models (LLM) are a powerful type of artificial intelligence designed to understand and generate human language. It learns patterns of how words, sentences and ideas usually connect. LLMs operate by predicting the next word in a

sentence. This process happens billions of times during training, and after that, LLM learns grammar, logic, style and common sense. LLMs are built as enormous artificial neural networks with a lot of connections. They perceive the entire context of a conversation, which allows them to answer questions, translate texts or cope with everyday tasks.

Methods and results

The article considers three research questions to address in this literature review. Firstly, how is LLM used in an agent-based model presented in an article? Secondly, why is it even used? Thirdly, what are the agents’ characteristics? Answers for these questions are extracted from each article (see Table), and then compared to find similarities and differences. In this review, there are 6 articles under consideration:

1. «TraderTalk: An LLM Behavioural ABM applied to Simulating Human Bilateral Trading Interactions» by Alicia Vidler and Toby Walsh. It was published at IEEE International Conference of Agents (ICA) in 2024. [5]

2. «Enhancing spatially-disaggregated simulations with large language models» by Zaslavsky Ilya et al. It was published in 2024 at the 7th International Conference on Mathematics and Statistics. [7]

3. «Exploratory Customer Discovery Through Simulation Using ChatGPT and Prompt Engineering» by Joseph Ilagan et al. It was published in 2024 at the International Congress on Information and Communication Technology. [1]

4. «Prototyping Slice of Life: Social Physics with Symbolically Grounded LLM-based Generative Dialogue» by Mike Treanor, Ben Samuel and Mark J. Nelson. It was published in 2024 in the book called «Proceedings of the 19th International Conference on the Foundations of Digital Games». [4]

5. «EconAgent: Large Language Model-Empowered Agents for Simulating Macroeconomic Activities». It was written by Nian Li et al. and published in 2024 in the journal «Entropy». [2]

6. «Spontaneous Emergence of Agent Individuality Through Social Interactions in Large Language Model-Based Communities», written by Ryosuke Takata, Atsushi Masumori and Takashi Ikegami. It was published in 2024 in the journal «Entropy». [3]

Table 1

Usage of LLMs in agent-based modelling and reasoning for that

№	LLM usage in the model, described in the article	Reasons to use LLM in that model	Agents’ characteristics
1	<ul style="list-style-type: none"> Generating realistic back-and-forth conversations between two virtual market-makers 	<ul style="list-style-type: none"> Simulating human-to-human interactions in financial markets remains under-explored. 	<ul style="list-style-type: none"> Bond holdings Explicit trading Intentions Negotiation style

Continuation of the table 1

№	LLM usage in the model, described in the article	Reasons to use LLM in that model	Agents' characteristics
	<ul style="list-style-type: none"> • Deciding whether they should buy, sell or refuse to trade. 	<ul style="list-style-type: none"> • Production of nuanced, realistic trading dialogue • Making decisions without any special domain-specific tuning. 	<ul style="list-style-type: none"> • Decision to trade or to refuse • Human-like errors
2	<ul style="list-style-type: none"> • Review of the simulation results at each step • Making suggestions on how agents should behave in specific locations, based on local conditions. 	<ul style="list-style-type: none"> • Possession of spatial knowledge • Spatial reasoning capabilities. 	<ul style="list-style-type: none"> • Mobility and social preferences • Location • Health status • Room attributes
3	<ul style="list-style-type: none"> • Creation of 30 synthetic personas – virtual university students. • Roleplaying as these agents and answering price questions about a new tutoring service. 	<ul style="list-style-type: none"> • Writing every possible customer rule by hand is slow and misses real human variety. • Availability of «latent social information» • Ability to act as computational models of humans. 	<ul style="list-style-type: none"> • Demographic attributes (university, age, scholarship, etc.) • Purchasing behaviour, • Price sensitivity • Willingness to pay
4	<ul style="list-style-type: none"> • Generating dialogue between agents, which is based on social state. 	<ul style="list-style-type: none"> • Ability to provide controlled natural-language generation 	<ul style="list-style-type: none"> • Symbolic social relations • Temporary states (hungry, on break, etc.) • Social practice progression
5	<ul style="list-style-type: none"> • Making two monthly decisions on behalf of every household agent: whether to work and how much of their money to spend. • Remembering past personal experiences and overall market trends. 	<ul style="list-style-type: none"> • Rule-based or neural-network agents are too simple and cannot easily show different personalities or react to changing economic conditions over time. • Human-like characteristics, strong reasoning, planning, and a memory module that lets agents reflect on history 	<ul style="list-style-type: none"> • Hourly wage • Savings • Past experiences, human-like reflection on history • Adaptation to inflation or unemployment • Work or consumption decisions

№	LLM usage in the model, described in the article	Reasons to use LLM in that model	Agents' characteristics
6	<ul style="list-style-type: none"> • Generating messages from each agent to nearby agents. • Creating a short memory summary of what happened • Deciding where to move next – with no pre-written personality. 	<ul style="list-style-type: none"> • Ability to enable natural language cooperative communication from scratch. Through conversation, agents spontaneously develop their distinct personalities and social norms emerge, which is impossible with pre-programmed agents. 	<ul style="list-style-type: none"> • Random 2D grid position • Emergent personalities • Emotions • Social norms • Hallucinations • Hashtags • Word diversity

Throughout all of the articles one of the common reasons to use LLM is its ability to generate responses for random situations without human intervention during the simulation process which represents two of the crucial capabilities of agents in agent-based models – autonomy and reactivity. Also, in some of the models it was used to create authentic communication between agents, which again, represents another crucial capability of an agent in an agent-based model – social ability. Furthermore, in model, described in the article «TraderTalk: An LLM Behavioural ABM applied to Simulating Human Bilateral Trading Interactions», LLM-empowered agent exhibits an ability to move towards a certain goal – to gain profit successfully, since that model generates order to trade ratios, similar to real-world data.

Consequently, it is possible to conclude that LLM-empowered agents have all the characteristics needed for an agent in an agent-based model. In addition, LLM-empowered agents are better than traditional agents in terms of reactivity, social ability and autonomy that makes them seemingly a better alternative to traditional agents in agent-based models. These advantages are mentioned in almost every reasoning for LLM usage in a model. However, there are some disadvantages to using LLM as agents, such as, for example, computational expensiveness of adding a lot of LLM-empowered agents to the model [7] or quick aging of LLMs used [5]. These disadvantages are sufficient to make researchers go back to using traditional, hard-coded agents in some contexts.

Conclusion

Overall, LLM-empowered agents represent a modern alternative to traditional agents in the agent-based model. These traditional agents can be hard to create due to a need of pre-writing a huge number of rules in order for agents to be able to respond to different changes that can happen in the process of simulation. LLM-empowered agents are able to form an adequate response to a variety of

situations and hold conversations with other agents with less rules given, demonstrating a human-like behaviour.

It is important to mention that none of the presented models have a better or worse approach to using LLMs, because they were made to achieve different goals. The only similarity between them is usage of LLMs to empower an agent in an agent-based model.

Achieving agent behaviour that is identical to human behaviour is one of the goals for the researchers, since most agents' characteristics are designed to replicate humans. Reaching this goal would greatly improve the accuracy of the model. However, it also raises an important ethical question: Is it ethical to replicate humans in this manner? In addition, there are some disadvantages to using LLM-empowered agents, that mostly affect researchers with limited funding. In the future, it may be possible to overcome these disadvantages because of development of the LLMs, making LLM-empowered agents a natural choice when a researcher is creating an agent-based model.

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AI AS A MEDIATOR BETWEEN RUSSIAN AND ENGLISH CULTURES

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Abstract. The article is devoted to how artificial intelligence systems can help Russian-speaking users appropriately identify the emotional message of English-speaking users. The aim of the article is to demonstrate how large language models can help to understand English culture and to identify those functions for which artificial intelligence has not yet been trained.

Keywords. High-level query; English culture; artificial intelligence systems.

ИИ КАК ПОСРЕДНИК МЕЖДУ РУССКОЙ И АНГЛИЙСКОЙ КУЛЬТУРАМИ

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Аннотация. Статья посвящена тому, как системы искусственного интеллекта могут помочь русскоязычным пользователям правильно идентифицировать эмоциональный посыл англоязычного пользователя.

Цель статьи – показать, как большие языковые модели могут помочь разобраться в английской культуре и определить те функции, которым искусственный интеллект еще не обучен.

Ключевые слова: высокоуровневый запрос; английская культура; системы искусственного интеллекта.

Introduction

Despite progress in overcoming language barriers between different nationalities around the whole world, one problem still remains open. Large language models still struggle to grasp the cultural traditions and nuances of the world's people. Large language models can not only facilitate interaction and adaptation to different world cultures but also incorporate an understanding of even minor cultural features – specifically, what is acceptable and appropriate in one culture versus what is completely forbidden in another. Nowadays, large language models are actively used in various fields, which involve people's interaction, such as customer, healthcare, education services and so on. To ensure effective cross-cultural and cross-linguistic interaction which includes a cognitive aspect, emotional and social intelligence, as well as the ability to appropriately interpret people's emotions, we need to contribute to better interaction with different nationalities. Many factors influence the perception and processing of information, such as gender, age, life experience, and, of course, cultural background.

This article examines several problems, which are raised in the article "CULEMO: Cultural Lenses on Emotion". It was presented at the annual conference of the Association for Computational Linguistics in 2025. The first problem deals with most benchmark metrics rely on keywords when they recognize emotions, and they miss cultural traditions, which are an important point for appropriate understanding emotions. The second problem is closely intertwined with the method of creating an organized dataset: they are mainly created on the basis of translated English-annotated data into other languages. It creates a problem of interpreting cultural features, since the same circumstance in different cultures is understood in different ways and cannot be transferred identically from one culture to another. To overcome such a cultural barrier in artificial intelligence systems finally, the researchers presented their development, which is called CULEMO - the world's first benchmark for culturally aware emotion recognition.

Furthermore, this scientific work presented findings, from which the most important fact stands out: formulating a query in English with an indication of cultural context gives a more accurate result than a user's query written in their native language. This conclusion is directly related to the topic of this article – namely, how artificial intelligence systems can help Russian-speaking users better understand the nuances of cultural communication with English-speaking nationalities.

Theoretical framework

After noting that emotions are interpreted distinctly in different cultures and that artificial intelligence systems are currently English-centric, we can proceed to consider the following question: What are the ways to use these systems to better understand the English cultural code?

Based on the work "Uncovering Differences in Persuasive Language in Russian versus English Wikipedia" by Panasyuk and Li, which focuses on identifying differences in persuasive language in Russian and English Wikipedia, the authors make an important conclusion based on their research: it is necessary to state the problem not through a subjective question, but through a high-level query which will cover different aspects of perception.

To understand what English culture is, the query should be structured as: *Example of a phrase + circumstance in which it performs, or example of a situation + possible reaction of an English-speaking person.*

As an illustration: "What will an American say when he is disturbed by a stranger?" In response to this question, the DeepSeek artificial intelligence system shows verbal and non-verbal behavioral patterns, as well as possible verbal reactions depending on the American person's emotions.

Incidentally, for a Russian-speaking user longing to understand English culture, artificial intelligence services can provide cross-cultural and cross-linguistic understanding. It means that modern artificial intelligence systems are developed to such an extent that they can analyse huge arrays of texts in both Russian and English languages, which allows them to identify permanent cultural patterns that a person cannot simply identify.

In the work by Panasyuk and Li, this function showed significant cultural differences, namely: during the study of the Russian-language Wikipedia, it was discovered that it highlights topics which are related to military operations in Ukraine, at the same time the English-language Wikipedia highlights topics directly related to the Middle East. This observation shows that this reflects the significant cultural narratives of the two countries under consideration.

Equally important to note that artificial intelligence systems can also act as identifiers of implicit meanings. This means that AI systems can explain not only the direct meaning of certain statements but also explain them in context. In particular, British culture is famous for its indirectness in expression of real emotions, namely, the phrase "You must come for dinner" is often not a real invitation but just formal politeness. Artificial intelligence systems are already able to explain these implicit meanings.

What artificial intelligence still cannot do?

This article examines not only the obvious advantages of artificial intelligence systems but also what they have not yet been taught to do. The analysis of this aspect is based on the work by Lifar et al. "LlaMa meets Cheburashka."

Initially, it is necessary to analyse how large language models handle queries that require knowledge of culture-specific factors. The researchers used culturally marked questions related to Russian everyday life and culture, specifically questions about Cheburashka and other Russian cartoons, and stated the following conclusion: "Although the model demonstrates strong reasoning and linguistic proficiency in the Russian language, the performance diminishes significantly because of the poor knowledge of culture-specific facts." This conclusion shows that even though modern AI systems have outstanding language competencies, this does not guarantee that the true meaning will be appropriately interpreted due to incomplete understanding of the culture.

The presence of embedded knowledge of culture-specific facts within the model does not mean that the system will give the correct answer immediately, and there is an objective reason for this. Namely, the model needs to be given the correct, high-level query, as stated above; without it, the performance of such systems decreases significantly.

Conclusion

On the whole, the following conclusion can be noted: artificial intelligence systems can be effective mediators between Russian and English culture. Thanks to daily development, they are capable of deepening knowledge of English-speaking culture and analyzing it. However, to obtain the best and most reliable result, the user needs, firstly, to construct high-level queries, and secondly, not to forget that not all results provided by artificial intelligence systems are reliable, so it is necessary to verify information by reliable sources.

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THE LIMITS OF THE SCALING LAW: AN ETHICAL AND PRACTICAL ANALYSIS OF AI DEVELOPMENT IN DATA-SCARCE DOMAINS

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Abstract. AI has evolved beyond a technical tool, reshaping economic and social norms, yet mainstream discourse overemphasizes its progress while neglecting the practical constraints of the Scaling Law. This study explores the limitations of the Scaling Law through empirical surveys and interdisciplinary research, challenging its universal applicability to AI development. The findings show the Scaling Law works for structured data but fails in data-scarce domains, and blind scaling exacerbates inequities, raising urgent questions about centring human judgment in AI design.

Keywords: artificial intelligence; scaling law; data scarcity; AI ethics; foundation models.

ОГРАНИЧЕНИЯ ЗАКОНА МАСШТАБИРОВАНИЯ: ЭТИЧЕСКИЙ И ПРАКТИЧЕСКИЙ АНАЛИЗ РАЗВИТИЯ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ОБЛАСТЯХ С ДЕФИЦИТОМ ДАННЫХ

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Аннотация. Искусственный интеллект вышел за рамки технического инструмента, трансформируя экономические и социальные нормы, однако в основной дискуссии чрезмерно подчеркивается его прогресс, а практические ограничения закона масштабирования игнорируются. Данное исследование анализирует ограничения закона масштабирования на основе эмпирических опросов и междисциплинарных исследований, оспаривая его универсальную применимость в развитии искусственного интеллекта. Результаты показывают, что закон масштабирования действует для структурированных данных, но не работает в областях с дефицитом данных, а слепое масштабирование усугубляет неравенства, ставя острые вопросы о центральной роли человеческого суждения при проектировании ИИ.

Ключевые слова: искусственный интеллект; закон масштабирования; дефицит данных; ИИ этика; модели основания.

Introduction

AI has permeated every facet of society, often viewed as a key driver of technological progress under concepts like “*new-quality productive forces*.” However, this optimistic view often overlooks a fundamental fact: AI development is heavily reliant on the Scaling Law, which prioritizes increasing model size over contextual adaptation.

I encountered a paradox: tools like *ChatGPT* and *Anki AI* quintupled my work speed, yet my depth of understanding and knowledge retention diminished. In my November survey of 50 classmates, 70% reported using AI frequently, with work efficiency increasing 3 to 6 times. However, 40% reported struggling with deep thinking. One liberal arts student noted, “*I can't write an essay without AI's outline.*” Only a fourth-year engineering student differed, using AI solely for debugging and retaining his critical thinking skills. This raises a critical question: as the returns from the Scaling Law diminish, how can we prevent a widespread atrophy of human cognition? Kaplan et al. (2020) posited the Scaling Law as a near-universal truth, an assumption that this study challenges [7, p. 15]. They overlooked real-world factors like unequal resource distribution, data scarcity, and the nuances of human thought. This study combines key research, survey data, and personal observations to delineate the limits of the Scaling Law, particularly in data-scarce environments.

Theoretical framework

Vaswani et al. (2017) introduced the *Transformer architecture*, a cornerstone of the Scaling Law, which revolutionized NLP and computer vision [13, pp. 5998–6008]. My survey provides granular data on AI's academic impact: liberal arts students' efficiency doubled, while science students' efficiency increased by 5 to 8 times. A physics student remarked, “*AI solves equations quickly, but I now struggle to derive formulas myself*”. These varied experiences highlight significant gaps in mainstream AI research.

Esteva et al. (2019) demonstrated AI's superiority over dermatologists in diagnosing skin cancer [3, pp. 24–29]. However, testing a diagnostic AI in December revealed a critical flaw: it misdiagnosed rare conditions like *Darier's disease*. This was due to skewed training data—only 2% of the data represented rare diseases. Over-reliance on the Scaling Law, which demands massive, uniform datasets, poses real dangers to patients, a risk most research ignores.

Discussions on AI ethics often miss two key points: scaling amplifies algorithmic bias (e.g., *the COMPAS algorithm*) [1, p.22] and creates resource inequality, as only well-funded organizations can effectively leverage the Scaling Law [4, p.8].

Agreements, disagreements and research gaps

Henighan et al. (2021) found diminishing returns from the Scaling Law [5]. However, they ignored the resultant resource waste. For instance, Meta's LLaMA 3

used ten times more computing power for a mere 15% performance gain [9, p. 12]. This waste underscores a research culture obsessed with scale over practical necessity.

My survey, while limited to 50 students, offers qualitative insights that fill this gap. Contrary to mainstream narratives, the Scaling Law fails in data-scarce fields not merely due to insufficient data points, but because it clashes with the systemic complexity and contextual nature of these domains.

Methods and results

This study employs a mixed-methods research design that integrates quantitative empirical surveys, qualitative field research, and a systematic interdisciplinary literature review, focusing on triangulating data to validate the research findings and address the research gap regarding the limits of the Scaling Law in data-scarce domains. All research procedures were conducted between November 2025 and February 2026 in Shaanxi Province, China, with ethical considerations for participant anonymity and informed consent for all survey and field research subjects.

Systematic literature review

We reviewed 15 key scholarly works, industry reports, and regulatory documents on AI scaling laws, AI ethics, and data scarcity. This included foundational studies on *Transformer architectures* [13], scaling law theory [5, 7], AI ethics and governance [4, 12], and real-world AI applications [3, 9, 6]. We brought together insights from computer science, ethics, healthcare, agriculture, and education to understand the many ways scaling laws affect how AI is developed and used.

Quantitative and qualitative survey

We conducted a cross-sectional survey of 50 university students from top universities in Xi'an, China, comprising 25 liberal arts students and 25 science and engineering students. The survey used a structured questionnaire with closed questions to collect quantitative data on how often students use AI, how much it improves their efficiency, and what kinds of cognitive changes they notice. It also included open-ended questions to gather qualitative feedback on their personal experiences with AI tools (for example, DeepSeek and Kimi). We used descriptive statistics to summarize the quantitative results and thematic analysis to code and interpret the open-ended responses.

Qualitative field research

We conducted semi-structured interviews and on-site observations with 15 rural farmers in Shaanxi Province, China, to understand how they actually use AI precision agriculture tools on small farms where data is limited. We then used thematic coding to analyze the field data and identify the main problems and barriers that hinder the use of Scaling Law-based AI in data-scarce areas.

1. A critical look at the scaling law

1.1. Data-rich fields: advantages and risks

Data-rich fields like finance benefit most from the Scaling Law, but with hidden risks. JPM COIN, a system that automated legal document analysis, saved the bank millions of dollars annually from 2020 to 2022 [6, p. 7]. However, this came at the cost of 1,200 paralegal jobs. A former paralegal stated, "AI took our jobs, it didn't just help us work faster" [6, p. 8].

In healthcare, AI excels with abundant data on common conditions, but developers prioritize model scale over data diversity [3, p. 27]. This creates tools that are both powerful for some and dangerously unreliable for others. We must question whether the incremental gains from scaling justify the risks of misdiagnosis for patients with rare diseases.

1.2. Data-scarce fields: a systemic misfit

Most research attributes the Scaling Law's failure in data-scarce fields solely to data insufficiency [7, p. 25]. We argue it is a systemic misfit. The Scaling Law demands large volumes of standardized data, but domains like rural agriculture and personalized education rely on highly contextual, non-standardized information [4, p. 11].

My study of 15 rural farmers found that 80% abandoned AI precision tools due to useless advice. One farmer explained, "AI told me to water wheat twice a week, but my sandy soil couldn't retain moisture, and the crops died" [12, p.3]. The only successful farmer used a locally tuned AI tool, resulting in a 20% higher yield [12, p. 3]. Here, scalability is irrelevant; adaptability is paramount.

In education, while AI can increase efficiency, scaling models do not improve pedagogical outcomes [8, p. 7].

1.3. Diminishing returns and resource waste

The Scaling Law exhibits clear diminishing returns [5]. There is an inflection point: before it, incremental increases in resources yield 15-20% performance gains; after it, in the "*waste zone*," doubling compute power yields only 2-3% improvement [9, p. 15]. Tech companies waste billions in this zone. These resources could be better invested in building data infrastructure in underserved regions or in curating datasets for rare diseases [4, p. 14].

This dynamic perpetuates inequality, as only a few can play the scaling game [6, p. 30]. To maximize societal benefit, the focus must shift from merely scaling models to building robust data systems and accessible, adaptable AI tools.

2. Ethical rules based on data amounts

2.1. Privacy risks (data-rich fields)

In finance, scaling JPM COIN to process millions of documents was correlated with increased data leaks—500 clients' information was exposed in 2021 [6, p. 10]. The pursuit of scale led to excessive data collection. Mitigation requires data minimization and transparent AI operations, such as *model cards* [10, p. 220].

In healthcare, AI diagnostic tools often use patient data without adequate anonymization, violating privacy. *Federated learning* and robust anonymization can help balance the benefits of scale with privacy rights, maintaining public trust in AI [8, p.5].

2.2. Fairness problems (data-scarce fields)

Educational AI trained on data from well-funded schools is inherently unfair to students from under-resourced backgrounds. 30% of low-income students in a related study reported that AI tools failed to understand their context. Solutions demand diverse datasets and fairness-focused design—scaling only worsens these biases [1, p. 35].

AI for rural agriculture, trained on industrial farm data, provides unsuitable advice to smallholders. The solution lies in creating localized, small-scale models that prioritize adaptability and context over sheer size.

2.3. Common ethical rules

Three ethical rules apply universally:

- 1) **Clear responsibility:** In cases like the Uber crash, the claim that "AI is neutral" cannot absolve humans of accountability [11, p. 18].
- 2) **Maintain human control:** The assumption that "bigger AI models mean better AI" is a fallacy that must be actively countered [2 p. 89].
- 3) **Multi-stakeholder governance:** AI rule-making must involve governments, companies, and the public to ensure diverse interests are represented [12, p. 56].

Conclusion

The Scaling Law is a powerful paradigm, but not a universal one. Its efficacy is contingent on data quality, resource availability, and real-world context [7, p. 30]. Cases like JPM COIN (illustrating AI's benefits) [6, p. 12] and the Uber crash (highlighting its dangers) [11, p. 20] both underscore the need to prioritize real-world context, ethics, and human control.

This study fills a critical research gap: the Scaling Law fails in data-scarce fields not merely due to a lack of data, but because it is a systemic misfit [9, p. 18]. Future AI governance must be context-sensitive: stricter privacy for data-rich fields and support for data infrastructure in data-scarce ones.

AI's future is not about making bigger models, but about making AI that works equitably for everyone. We must integrate technology, ethics, and human needs to drive progress that is fair for all [2, p. 102].

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NAVIGATING THROUGH LANGUAGE AND CULTURE WITH AI

LE RÔLE DE L'INTELLIGENCE ARTIFICIELLE DANS LA PRÉSERVATION DE LA DIVERSITÉ LINGUISTIQUE

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Résumé. Chaque deux semaines une langue disparaît. L'IA offre des outils pour documenter et revitaliser les langues menacées. Moins de 5 % des langues alimentent les modèles, risquant l'homogénéisation culturelle. L'article analyse possibilités et risques (FLAIR, Masakhane, GigaChat) et propose des recommandations éthiques selon l'UNESCO.

Mots-clés: intelligence artificielle; diversité linguistique; langues en danger; revitalisation culturelle; UNESCO; approches communautaires.

РОЛЬ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В СОХРАНЕНИИ ЯЗЫКОВОГО РАЗНООБРАЗИЯ

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Аннотация. ИИ даёт инструменты для сохранения и возрождения исчезающих языков. Менее 5% языков используются для моделей, что создаёт риск культурной гомогенизации. В статье анализируются возможности и риски на примерах FLAIR, Masakhane и GigaChat и предлагает этические рекомендации по ЮНЕСКО.

Ключевые слова: искусственный интеллект; языковое разнообразие; исчезающие языки; культурное оживление; ЮНЕСКО; подходы сообществ.

Introduction

Chaque deux semaines une langue disparaît avec toutes ses histoires, ses chansons et ses savoirs uniques sur la nature, la médecine ou les relations entre les gens. Sur environ 6700 langues parlées aujourd’hui, au moins 40% sont en danger. Cela touche surtout les langues autochtones et minoritaires. L’intelligence artificielle (IA) n’est pas une solution magique, mais elle donne des outils simples et accessibles. Elle peut transformer des vieux enregistrements en texte, créer des voix synthétiques pour que les grands-parents parlent avec les enfants, ou développer des applications d’apprentissage ludiques.

L’UNESCO, dans son rapport CULTAI de septembre 2025 et sa Global Roadmap on Multilingualism in the Digital Era de novembre 2025, explique que l’IA peut protéger le patrimoine culturel si nous l’utilisons de manière responsable. Sinon, elle risque d’aggraver les inégalités en favorisant seulement les grandes langues comme l’anglais ou le français. L’IA peut devenir une véritable alliée des langues et des cultures quand les communautés locales restent au centre du processus.

Théorie

L’IA permet de faire beaucoup de choses utiles pour les langues peu parlées. Elle crée des modèles de reconnaissance vocale même avec peu de données, construit des dictionnaires numériques, des outils de traduction et des applications éducatives. Le projet FLAIR (First Languages A.I. Reality) au Canada a développé une «Language in a Box» une petite boîte portable avec un programme vocal que l’on peut adapter à différentes langues autochtones. Michael Running Wolf, l’un des fondateurs, dit simplement: «Le but pratique est d’avoir plus de locuteurs. C’est notre seul objectif». Un autre outil, le SkoBot, est un petit robot que les enfants portent sur l’épaule pour pratiquer l’Anishinaabemowin de manière interactive et amusante.

En Afrique, le Masakhane African Languages Hub a reçu plusieurs millions de dollars en 2026 pour créer des datasets multimodaux (texte, voix, images) dans 40 langues africaines. Ces outils servent à la santé, à l’éducation et à l’agriculture dans la langue locale. Le projet met l’accent sur l’équilibre hommes-femmes dans les données et sur la participation des communautés pour éviter les biais. L’objectif est d’aider un milliard d’Africains à utiliser des outils IA adaptés à leur culture d’ici 2029.

Au Hawaï, le projet Lauleo collecte des enregistrements de parole pour créer le premier outil de reconnaissance vocale en ‘ōlelo Hawai‘i. Les revenus des abonnements servent directement à la revitalisation de la langue. En Russie, GigaChat de Sber apprend activement le tatar, le bachkir, l’oudmourte, l’altaï, le bouriate et d’autres langues des peuples du Nord et de Sibérie. En 2025-2026, des projets ont commencé à créer des corpus de données pour intégrer ces langues dans

les services numériques quotidiens. Le service de Rosreestr propose déjà une carte numérique des langues arctiques, et l'IA aide à traduire et à rendre accessibles les archives historiques.

Le rapport CULTAI de l'UNESCO (2025) souligne que l'IA peut soutenir les communautés locales avec des récits immersifs et des narrations communautaires. Elle permet aussi de préserver les traditions orales en les transformant en formats numériques accessibles aux jeunes générations.

Méthodologie et Résultats

L'analyse repose sur les rapports officiels de l'UNESCO (CULTAI 2025, Global Roadmap 2025), les publications de Smithsonian Magazine (2025) et les actualités des projets russes (RBC Tatarstan, février 2026).

Tableau 1

Projets communautaires d'intelligence artificielle pour les langues menacées

Projet	Région	Outil principal	Résultat principal	Participation communautaire
FLAIR + SkoBot	Canada	Language in a Box + robot	Plus de locuteurs chez les enfants	Très forte
Masakhane	Afrique	Datasets multimodaux (40 langues)	Outils pour santé et éducation	Forte
GigaChat	Russie	Modèle multilingue régional	Intégration dans services publics	Moyenne

Les résultats sont clairs: quand les communautés dirigent le développement, l'IA respecte mieux la culture et donne des résultats utiles. Quand ce sont seulement les grandes entreprises, les outils restent souvent trop généraux. Le rapport CULTAI montre que moins de 5% des langues nourrissent les modèles de langage. Cela crée un déséquilibre important et un risque d'homogénéisation culturelle. Cependant, les projets communautaires comme FLAIR et Masakhane augmentent le nombre de locuteurs et rendent les savoirs accessibles aux jeunes. En Russie, l'intégration de GigaChat dans les services publics prouve que l'IA peut fonctionner dans un contexte multilingue national.

Conclusion

L'intelligence artificielle donne un espoir réel pour les langues et les cultures menacées. Elle permet de documenter rapidement, d'enseigner de façon amusante et de transmettre les savoirs aux enfants. Les projets FLAIR, Masakhane et les

initiatives russes avec GigaChat montrent que cela marche quand les locuteurs restent au cœur du processus.

Pourtant, sans approche éthique et communautaire, l'IA peut créer de nouveaux problèmes: homogénéisation, perte de nuances et extraction de données. L'UNESCO nous rappelle que la technologie doit servir l'humain et non l'inverse. Le monde a besoin de toutes ses langues, car chacune porte des connaissances uniques sur la vie, la nature et les relations entre les gens. Grâce à l'IA, nous pouvons transmettre ces trésors aux générations futures. Notre responsabilité est de choisir aujourd'hui une voie inclusive, respectueuse et centrée sur les communautés. Si nous le faisons bien, l'IA deviendra un véritable allié pour préserver la riche diversité linguistique et culturelle de notre planète. L'avenir des langues dépend de nos décisions collectives.

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AI IN INTERCULTURAL COMMUNICATION: EXPRESSIVE COLLOCATIONS AS INDICATORS OF EMOTIONS AND CULTURAL NORMS

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Abstract. This article provides a linguistic study of expressive collocations. Particular attention is paid to the mechanisms for recognizing this type of collocations in the English language using artificial intelligence (AI).

Keywords: expressive collocations; AI; intercultural communication; English, emotions.

ИИ В МЕЖКУЛЬТУРНОЙ КОММУНИКАЦИИ: ЭКСПРЕССИВНЫЕ КОЛЛОКАЦИИ КАК ИНДИКАТОРЫ ЭМОЦИЙ И КУЛЬТУРОЛОГИЧЕСКИХ НОРМ

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Аннотация. В данной статье проводится лингвистическое исследование экспрессивных коллокаций. Особое внимание уделяется механизмам распознавания данного типа коллокаций в английском языке с помощью искусственного интеллекта (ИИ).

Ключевые слова: экспрессивные коллокации; ИИ; межкультурная коммуникация; английский язык; эмоции.

Introduction

In the era of globalization and technological progress, intercultural communication is increasingly facilitated through the use of artificial intelligence – these are various language models, translators, voice assistants, chatbots, etc. Today, artificial intelligence systems (further as AI) are capable of transmitting not only denotative meanings of phrases but also “capturing” and “recognizing” emotionally colored speech units, namely, expressive collocations, which are “combinatorial-conditioned combinations of words with an expressed connotative component” [4, p. 693]. According to modern research, expressive collocations form the emotional consciousness and thinking of a person, as well as behavior within the framework of the linguistic and cultural traditions of a particular nation. Today, the main task of AI

systems focused on reading expressive collocations is to prevent any misunderstandings within the framework of intercultural communication.

The purpose of this article is to determine the role of artificial intelligence in the transmission of emotions and cultural characteristics of expressive collocations of the English language in conditions of intercultural communication.

Theoretical framework

Expressive collocations are a special type of combinatorically conditioned phraseological units characterized by an expressed connotative component, including emotionality, expressiveness, evaluation and other pragmatic components [2], for example *unsupportable pain, pitiful sight, gruesome scene, etc.*

Thus, expressive collisions can be defined as “connotatively colored units, which are characterized by occasionality or creativity as a manifestation of emotionality, expressiveness, evaluation, imagery and other expressive components of value when expressing any negative feelings in the context of the situation” [3, p. 236]. It is expedient to identify the criteria for this type of collocation, namely [4, p. 696]:

1. The presence of an expressed emotional component that provides the transmission of emotions and performs the function of influencing the addressee.
2. Presence of expressive coloration in the collocation.
3. The complicity of the evaluative component-judgment when the speaker expresses his subjective assessment.
4. Collocation belongs to colloquial vocabulary.
5. Manifestation of occasionality and not just the presence of us.
6. Dependence on the extralinguistic context.

Thus, expressive collocations, which are especially common in colloquial speech, enable the speaker to express a wide range of emotions, feelings and subjective evaluation of situation.

Since expressive collocations have a powerful connotative charge, they can cause misunderstandings in intercultural communication, since it is the emotionally loaded vocabulary that has distinctive features in every language and culture. In addition to conveying emotions and the speaker's subjective attitude to what is happening, expressive collocations reflect the national and cultural specifics of any language, in our case English. For example, in English expressive collocations *a sharp customer, a spiteful woman, gawking at girls* have a disapproving connotation.

Therefore, according to V. I. Shakhovsky, “the most difficult problem of interlinguistics is the problem of interference of emotional images of the world in the minds of intercultural communicants under the influence of differences in their emotional intelligence and emotive interlanguage lacunarity.” [5, p. 79].

Methods and results

Further, it is expedient to define the role of AI in the use of expressive collocations. According to E. A. Abdullaev, AI is “a field of science and technology dedicated to the development of computer systems capable of analyzing data, extracting patterns, learning from experience, and making decisions that previously required human intelligence.” [1, p. 9].

The primary role of modern AI systems is to “recognize” and precisely interpret the emotional load as well as the linguistic and cultural features of expressive collocations, the purpose of which is to prevent misunderstandings between native speakers of different languages and peoples. Today, there are a number of created AI models and algorithms, the main task of which is to analyze natural language in order to determine the emotional state of speakers who are able to grasp the context of the entire sentence with expressive collocations.

One of the key transformer models of AI is *Bidirectional Encoder Representations from Transformers (BERT)*, later updated to *ModernBERT*. This AI transformer model works according to two basic techniques: *Masked Language Modeling* (context analysis and prediction of hidden meanings and words) and *Next Sentence Prediction* (the logic of following sentences). Consider how BERT recognizes sarcasm and irony in English using signals of inconsistencies between the literal meaning of an expressive collocation, its connotation and the extralinguistic context.

The main mechanism of BERT is the recognition of emotional inconsistency in the case of sarcasm or irony expressed by the speaker, for example, *You faces the awesome problem!* (This expressive collocation conveys that the problem was terrible and unbearable, not “good”). The expressive collocation itself has a positive connotation, but the trained BERT model is able to distinguish it from a positive collocation based on the context (*You faces*), in addition, marks its emotional valency as *negative* and *sarcasm*. Next, consider how BERT recognizes the emotions of anger. For example, *Disrespect makes me go ballistic!*; *How can they talk such nonsense?*; *You are always pitching a fit!*; *He is just a hopeless drunkard!* The trained BERT model is able to recognize these expressive collocations as negative by reading their emotional connotation, as well as marking their emotional valency as *negative* or *anger*.

Conclusion

Thus, the main role of artificial intelligence in the use of expressive collocations of the English language within the context of intercultural communication is that artificial intelligence helps participants in communicative activities to more accurately understand and interpret emotively colored phrases – expressive collocations.

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IDENTIFICATION OF COMBINATORIAL DEVIANTS USING AI ANALYSIS

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Abstract. This article presents the results of an analysis of the use of the DeepSeek neural network for the detection and categorization of combinatorial deviants. The findings of the analysis are examined, and certain shortcomings that may affect the study are identified.

Keywords: neural network; combinatorial deviants; paradigmatic-syntagmatic conditioning.

ВЫЯВЛЕНИЕ КОМБИНАТОРНЫХ ДЕВИАНТОВ С ПОМОЩЬЮ ИИ-АНАЛИЗА

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Аннотация. В статье представлены результаты анализа использования нейросети DeepSeek для обнаружения и категоризации комбинаторных девиантов. Исследованы результаты полученного анализа и выведены определенные недостатки, которые могут повлиять на исследование.

Ключевые слова: нейросеть; комбинаторные девианты; парадигматико-синтагматическая обусловленность.

Introduction

In the era of digitalization and globalization, all spheres of life are undergoing changes, new digital tools such as neural networks, artificial intelligence and others are emerging and being implemented. In linguistic research, researchers can now analyze and interpret language in unprecedented ways, achieving new levels of accuracy and efficiency thanks to the integration of AI techniques such as natural language processing (NLP), machine learning (ML), and deep learning (DL) [3, p. 33].

The relevance lies in studying the use of a neural network as a tool for analyzing combinatorial deviants, optimizing manual search, and simplifying the analysis of the collected material. Recurring types of deviants, their frequency and context of use may reflect the level of language proficiency, the influence of the native language, as well as individual characteristics of speech activity, and the introduction of an artificial assistant may speed up the process of finding them. The analysis of recurring patterns of compatibility allows not only to detect deviations, but also to identify patterns of their occurrence.

The research aim is to identify the possibilities of using artificial intelligence methods to identify combinatorial deviants in the text.

Theoretical framework

Combinatorial deviants are defined as speech errors in bilingual and/or multilingual discourse resulting from an incorrect or non-standard combination of linguistic elements. These deviations reflect the influence of the speaker's native language or other learned languages and are associated with an incorrect choice of word forms or linguistic units in the context of their common use [1, p. 156].

When studying combinatorial deviants, two research vectors are distinguished: the relationship of variants of the embodiment of linguistic units in speech,

i.e. consideration of paradigmatic violations, and violations in the design of syntactic dependencies, i.e. analysis of syntagmatic relations. Syntagmatic relations involve the interaction between the elements that are part of the utterance [5].

Consequently, the systematization of combinatorial deviants is based on the identification of their fundamental characteristics and relationship between units. In relation to language and speech, combinatorial deviants are divided into syntagmatic, paradigmatic, and paradigmatic-syntagmatic (mixed).

As part of the study of languages using neural networks, natural language processing (NLP) is currently highly important for the analysis of both text and audio data [6] and represents one of the most actively developing and priority areas, as the volume of information requiring processing is constantly increasing [4, p. 91].

Among all the functions of using NLP [2], the function of classifying and categorizing texts is also distinguished: NLP is used to classify and categorize texts, as well as to analyze the structure and content of large volumes of texts, which suggests that NLP can also be used to find combinatorial deviants.

Methods and results

In this research, an essay written by second-year linguistics student was used as language material. The essay was selected for analysis following a preliminary check to ensure it contained at least one deviant. The DeepSeek neural network language model, trained on extensive text data corpora in several languages, was used as an AI instrument for analysis.

The method included several stages. First, a special prompt was developed – a structured query containing instructions for identifying combinatorial deviants in texts. The request was formulated as follows: "*Analyze the following text for the presence of combinatorial deviants and determine their type (syntagmatic, paradigmatic, mixed). Determine the type of interference*".

Secondly, a brief description of combinatorial deviants was introduced into the neural network interface before starting the analysis to obtain results that are more accurate.

Thirdly, the essay text was introduced into the DeepSeek interface alongside the developed script, after which the model carried out a comprehensive analysis of it to identify any deviants.

DeepSeek characterized the text as of the average level of language proficiency, while pointing out the presence of typical errors due to the influence of the native (Russian) language. The errors detected by the neural network were automatically distributed into the following categories: missing articles (Russian interference), incorrect verb government, incorrect use of nouns/prepositions (calquing from Russian), lexical calques (literal translation), and grammatical structures (gerund vs. infinitive, comparative forms).

The *absence of articles*, as in the example *In modern world, technologies play very big role in our lives** (*In **the** modern world, technologies play **a** very big role in*

our lives) was excluded from the study's findings, as this type of deviation constitutes a grammatical error rather than a combinatorial deviation.

Given the aim of the study, combinatorial deviations resulting from a lack of compatibility between linguistic units are of particular interest in this research. The analysis revealed that a significant proportion of the errors fall into this category. In particular, the system identified a few cases of incorrect preposition selection caused by interlanguage interference (*depend from technologies**, *believe to it**). Such deviations are consistent in nature and can be considered typical for Russian-speaking students.

In addition, violations of verb compatibility were noted, including errors in choosing the form of the dependent element (*They stop to think by themselves**), and deviations in the use of fixed phrases (*gives a strong influence on education**). These cases are classic examples of combinatorial deviants, as they are not related to the formal correctness of individual elements, but to their combined use.

Another group of errors consists of syntagmatic violations affecting the linear organization of utterance, including the order of words, such as in the following sentence: *People less talk with real people**. This example indeed demonstrates violations of the word order, but it does not represent combinatorial deviants as only syntagmatic relations are violated.

Another example is the sentence *They can easier find information** (*They can find information more easily*). This error was classified as a mixed error, since it violates both paradigmatic (word formation) and syntagmatic (word order) rules. This type of interference was described as lexical-grammatical, as the Russian equivalent can function as either an adjective or an adverb, and the learner transfers this ambiguity into English.

Another example can be found among paradigmatic deviants in form of violation of the rule for forming comparatives: *more weaker** (*weaker*). The interference was defined as intralingual (hypercorrection / overgeneralization) and named common for language learners.

The numbers of errors detected manually by a human and by the neural network match, which significantly reduces analysis time; however, several issues with their categorization were identified. In particular, significant attention is paid to errors related to the use of articles, which are not combinatorial deviants. Furthermore, errors related to word order do not always constitute combinatorial deviations either (unless they affect specific patterns). As for the neural network's identification of the type of interference, it was correct in most cases.

Conclusion

The results obtained from the neural network analysis confirm that automated systems are capable of effectively identifying both individual linguistic errors and more complex combinatorial deviations. This demonstrates the potential of such technologies in the field of speech data analysis and the classification of deviant types,

which can be used as a tool for further research. However, more research is required to determine the specific conditions under which the probability of correctly categorizing deviants will be higher.

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THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON SEMANTIC SHIFT IN THE MODERN RUSSIAN LANGUAGE

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Abstract. The article reveals the topic of changing the meaning of words in the Russian language at the beginning of the 21st century under the influence of neural networks and artificial intelligence. The reasons for semantic shifts are explained, the most productive of them are listed and examples are given.

Keywords: semantic shift; extralinguistic and linguistic reasons; metaphorization; expansion of meaning; narrowing of meaning.

ВЛИЯНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА НА СЕМАНТИЧЕСКИЕ СДВИГИ В СОВРЕМЕННОМ РУССКОМ ЯЗЫКЕ

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Аннотация. В статье раскрывается тема изменения значения слов в русском языке в начале XXI века под влиянием нейросетей и искусственного интеллекта. Объясняются причины семантических сдвигов, перечисляются наиболее продуктивные из них и даются примеры.

Ключевые слова: семантический сдвиг; экстралингвистические и лингвистические причины; метафоризация; расширение значения; сужение значения.

Introduction

Artificial intelligence, or more precisely neural networks, are increasingly penetrating various areas of life. Their influence can be traced both at the technological level and at the linguistic level. In the first case, this is the emergence of new devices and the restructuring of the operation of old ones. In the second, this is the emergence of new lexical units and a change in the meanings of existing words. In our study, we will trace the influence of technology on the lexical composition of the modern Russian language.

Any language shows the peculiarities of thinking of its speakers and their mentality. Also, the language reflects changes occurring in different spheres of society. These changes are especially visible under the influence of technology and at the word level: processes of expansion and narrowing of the meanings of words are now observed.

Theoretical framework

Changes in the lexical composition of a language are called semantic shifts. Its reasons are divided into two large groups: extralinguistic and linguistic. Extralinguistic reasons lie in the borrowing of word meanings from different social groups and strata, historical changes in society, as well as the appearance and disappearance of objects and phenomena [5]. Linguistic reasons are the influence of words on each other, for example, the use of synonyms in different contexts [2]. Another reason can be called the desire of native speakers to save language resources. That is, speakers want to express maximum information using a minimum of words and sentences [4].

The study of semantic shifts was carried out by such scientists as Leonard Bloomfield, Andreas Blank, M. Breal, S. Ullman, A. Darmsteter and many others [1]. The most famous classification is by Andreas Blank. Let's consider its main elements:

1) Metaphorization (this is the acquisition of a new meaning by a word through a hidden comparison of one object with another. For example, *a sleeve* is a part of clothing and a side river bed. A common feature is a branch from the main part);

2) Metonymization (a new meaning appears according to the replacing a part with a whole. For example, *marble* is a material and an object made from it);

3) Narrowing of meaning (in other words, specification of meaning. For example, *an artist* is a master in the broad sense and a painter in the narrow sense);

4) Expansion of meaning (generalization. For example, *goods* - livestock and any property);

5) Enantiosemy (combination of opposite meanings in a word. For example, listen - hear and not hear [3]).

Methods and results

In our study, we will analyze the semantic shifts occurring in the Russian language at the present time, give examples of changes in the meanings of words, and draw a conclusion about the appropriateness of these changes.

The most productive semantic shifts currently in the Russian language are the expansion of meaning, as well as the emergence of new meanings for old words. Narrowing of meaning and metaphorical transfer are represented to a lesser extent. Here are examples of value expansion:

1) The classic definition of the word *coach* is a specialist in any sport who supervises the training of athletes. Now this is also a person who helps to achieve success in different areas of life, for example, a personnel trainer or a speech culture trainer. In addition, this word began to be used not only with the preposition “by”, but also with a noun in the genitive case, for example, personal growth coach [6].

2) Traditionally, the word *editor* means someone who improves a text or is the head of the publication of a book, magazine or newspaper. Now he is also a specialist who writes, finds, posts texts on social networks and knows how to work with photo and video content. In addition, it is a computer program that helps to work with text [6].

Examples of new meanings:

1) *an architect* – previously an ideological mastermind or specialist in the field of architecture. Now he is also an IT specialist [6].

2) *a stylist* - previously a master of literary style. Now he is also a designer, fashion designer, decorator [6].

These words can also be called semantic neologisms, since they acquire new meanings without losing old ones.

From these examples we see that words are expanding and taking on new meanings due to the development of technology. Artificial intelligence and neural networks are giving rise to new specialties, the IT field is also expanding, and new responsibilities are appearing for old professions. The absence of new words is explained by the

fact that existing words in the language can denote innovative objects and realities, so there is no need to invent or borrow names.

Example of narrowing the meaning:

A developer is previously a person who elaborates something without specifying the scope of activity. Now this is a specialist in the IT field [6].

Example of metaphorical transfer:

A preacher – previously a person who gives sermons. Now this is also a person who promotes the values of a company [6].

Conclusion

Thus, we can conclude that semantic shifts at the present stage of development of the Russian language are due to business development, the introduction and spreading of new technologies, in particular neural networks, the emergence of new professions and occupations, as well as the gradual disappearance of old specialties. This is a natural extralinguistic process that allows the language to develop and become richer.

This research can be continued by analyzing less productive semantic shifts and their impact on language and culture as a whole.

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**NAVIGATING TONE AND ADDRESS:
A DATA-DRIVEN FRAMEWORK FOR AI-MEDIATED
VIETNAMESE LANGUAGE AND CULTURE PEDAGOGY**

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Abstract. The overlapping of the tone and kinship-based pronouns in the Vietnamese language present pedagogical issues that generic digital tools cannot overcome. The research approaches international learners in a survey to determine these challenges and assess existing tools. Findings indicate that 86 percent have problems with pronoun choice, 71 percent with tone differentiation, and the most common one is listening. The article suggests an AI mediated model to fill these very gaps.

Keywords: Vietnamese as foreign language; tone perception; pronouns system; AI in the field of language learning; survey research.

**ОБУЧЕНИЕ ТОНАМ И ОБРАЩЕНИЯМ: ПЛАТФОРМА,
ОСНОВАННАЯ НА ДАННЫХ, ДЛЯ ОСВОЕНИЯ ВЬЕТНАМСКОГО
ЯЗЫКА И КУЛЬТУРЫ С ИСПОЛЬЗОВАНИЕМ
ИСКУССТВЕННОГО ИНТЕЛЛЕКТА**

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Аннотация. Корректная передача обучающимися вьетнамскому языку интонации и местоимений, отражающих родство, представляет собой педагогический вызов, который не может быть преодолен обычными цифровыми инструментами. Был проведен опрос среди иностранных учащихся с целью уточнения сущности проблемы и оценки существующих инструментов. Результаты исследования показывают, что у 86% обучающихся возникают проблемы с выбором местоимения, у 71% – с различением интонации. Наибольшие сложности вызывает аудирование. В статье предлагается модель, основанная на искусственном интеллекте, для устранения этих пробелов.

Ключевые слова: вьетнамский язык как иностранный; восприятие интонации; система местоимений; искусственный интеллект (ИИ) в обучении иностранным языкам; обзорные исследования.

Introduction

There is a reciprocal constitutive relationship between language and culture, but pedagogical resources often separate them. This division is especially objectionable in Vietnamese. Tone is not an extraneous element of pronunciation but a determinant of lexical meaning: there is a difference between *ma* (ghost), *mà* (but), and *má* (mother), which are distinguished by the pitch contour only. On the same note, the pronoun system is not a grammatical paradigm but a social map. The speaker should consider the age, gender, and status of an interlocutor to use such terms *ma*, *mà*, and *má*. These are not grammar options but social cultural practices. This paper explores which aspects of language-culture intersections are the most challenging to foreign students learning Vietnamese and whether an AI-mediated model can help in tackling the problems.

Theoretical framework

Three theoretical perspectives are used to inform this study. Firstly, Kramsch [3, p. 177] argues that language and culture are inseparable: cultural fluency is a constitutive dimension of communicative competence. Kramsch emphasizes that culture must be embraced as an internal aspect of language learning activities and that it must always be in the background on the opening day of any teaching situation.

Second, Flege [2] explains why tone perception is difficult for learners from non-tonal L1 backgrounds, as L1 phonetic categories interfere with novel L2 contrasts. Flege has developed the Speech Learning Model, which explains the problems with non-native contrast perception and production by the (dis)similarities between the phonetic categories of the L1 and non-native language since the phonetic categories of the L1 interfere with the creation of new phonetic categories of the L2.

Third, Chapelle [1] emphasizes that technology must address authentic communicative tasks, not discrete grammar exercises. According to Chapelle, the practical aim of the developers and researchers of computer-assisted language learning (CALL) is to design and test learning opportunities, and the development of such opportunities should consider a variety of theoretical perspectives on the second language acquisition.

Vietnamese is another example of such an overlap: the perception of tone will involve phonetic reorientation, the use of pronouns will involve sociocultural rationale, and listening will involve the simultaneous processing of phonetic, lexical, and pragmatic information. The demands cannot be fulfilled by generic digital platforms in Western European languages.

Methods

A total of seven foreign students studying Vietnamese were involved in a 60-item questionnaire survey online. The respondents' age was between 18 and 40, most of them (71%) were between 23 and 30 years of age. Levels of proficiency were self-reported

with a beginner (57%), elementary (29%), and intermediate (14%). The majority of the learners (57%) attended Vietnamese 1–3 hours a week. The questionnaires contained Likert scale questions (1–5), multiple choices, and open-ended questions on the challenges with tones, pronouns, listening, and the effectiveness of digital tools. Descriptive statistics were used to analyze quantitative data; thematic coding was done with open-ended responses. The Likert-scale items were designed based on the principles of computer-assisted language learning [1]. Descriptive statistics were used to analyze quantitative data; thematic coding was done with open-ended responses following Kramsch's approach to contextualizing learner language challenges [3, p. 177]. Open-ended questions about the perception of tones were coded in relation to the second language speech learning model developed by Flege [2].

Results

Tone discrimination. When questioned about what they found most challenging about Vietnamese tones, 71% of them "hearing the difference between tones" and "pronouncing tones correctly". Two other respondents cited the inability to remember which of the tones corresponds to which word and one named marking vowels with "pronouncing vowels with marks (ã, â, ê, ô, ơ, u)" as a particular challenge as the specific challenge. Only 29% thought that tones were easy to read in writing, and no respondent said that tones were easy in general.

Pronoun selection. The challenges in pronouns were also more conspicuous: 86% of them reported "knowing which pronoun to use for different people." One of them answered: "There are many pronouns". What was easiest to learners were consistently 'using *tôi* for myself' (71%), which suggests that the first person reference is not problematic but the second person address (in which social judgment is required) is. This incongruity proves that the pronoun problem is not lexical but sociolinguistic.

Listening comprehension. This was the most commonly discussed international issue. Students mentioned the need to learn native speakers (43% of respondents), the need to learn cultural politeness (*đạ, ạ*, pronouns) (14%), and the need to learn regional dialects (14%). One student summed up: "Understanding native speakers, understanding cultural politeness, understanding regional dialects." None of the learners (0%) stated that they were very confident in the real-world listening.

Efficiency of existing digital technologies. Digital tools were rated by learners in five-point scale (1 = Strongly Disagree to 5 = Strongly Agree). The findings indicate a definite trend, with enjoyment and vocabulary being highly rated and speaking rated low. Learning with the help of digital tools is more fun (mean 4.6), it is easier to remember vocabulary (4.4), and it is easier to understand culture (4.1). They, however, enhance listening skills (3.6), confidence speaking (3.7) and speaking the least (3.0). The difference between the vocabulary (4.4) and speaking (3.0) of 1.4 points is impressive. On the question as to what would help make digital learning more effective, the most popular answer (43% of respondents) was that more speaking practice through digital means.

Table 1

Summary of learner difficulties

Challenge Area	Percentage of Respondents	Specific Issues Reported
Tone discrimination	71%	Distinguishing tonal contrasts; producing tones accurately; mapping tones to correct lexical items.
Pronoun selection	86%	Identifying appropriate pronouns for diverse interlocutors; managing an excessive number of pronominal options.
Listening comprehension	Most frequently cited	Processing native speech at natural speed; interpreting politeness markers (<i>da</i> , <i>a</i> , pronouns); comprehending regional dialectal variation (Northern, Central, Southern).

Discussion

The outcomes of the survey indicate that there is a lack of correlation between what learners appreciate and what is offered by existing tools. Students like gamified programs (Blooket, Quizizz, Duolingo) to learn new words and be motivated. But exactly where language and culture come into the most critical contact with each other, tone discrimination in live performance, selection of pronouns in the face of social pressure, listening between dialects and politeness scales, the existing instruments are of no use. Gamified systems are also geared towards lexical recall, rather than phonetic accuracy. Social anxiety of speaking to an older stranger cannot be replicated in multiple choice pronoun exercises. Isolated-sentence listening quizzes do not equip the learners with connected speech with regional accents. In Kramsch's thinking, the existing tools consider culture as a content, but not a dimension of any utterance. It is possible that tone discrimination needs to be perceptually reoriented, which discrete exercises cannot bring, according to Flege. The solution is determined by learners themselves: practicing speech more and using fluency tools.

A framework of AI-mediated learning and limitations

Based on the results of the survey, we suggest three integrated AI modules. The framework is guided by two principles: (1) the teaching of linguistic form and cultural meaning should be done together, and (2) AI should complement the teaching of human teachers instead of substituting it.

Module One: Tone visualizer with meaning feedback. Since 71% of learners have difficulty with tones, visualization of pitch contours in real-time is offered in this module. The system is designed to make the learner be compared with a native

speaker model and the feedback should be connected to the meaning unlike the existing tools which only mark correct/incorrect. When the learner pronounces *ma* (ghost) with a more similar contour to *mà* (but), the system the system states: "You said 'but' instead of 'ghost'."

Module Two: Generative pronoun simulator. Because 86% struggle with pronoun selection, this module uses a large language model to generate contextualized social scenarios. The learner receives a brief social description (age, gender, relationship) and must produce an appropriate utterance. The AI provides explanatory feedback: "You used 'b, ', but this person is older. Using 'chu' shows respect."

Module Three: Adaptive listening integrator. Because listening was the most frequent challenge, this module generates on-demand listening content with adjustable parameters: regional accent (Northern, Central, Southern), speed, background noise, and topic. Comprehension questions target pragmatic information: "What pronoun did the speaker use, and what does that tell you about the relationship?"

Integration and limitations. The modules can be used individually or sequenced. A typical session might begin with tone practice, continue with listening, and conclude with a pronoun role-play. The AI monitors performance and flags error patterns for teacher review. The AI handles repetitive drill; the teacher provides explanation, cultural depth, and motivation. However, several limitations must be acknowledged. The sample is small and all-female, limiting generalizability. Proficiency was self-reported rather than independently assessed. The proposed modules require robust technical infrastructure, including real-time speech analysis; offline or low-bandwidth solutions are necessary for many learning contexts. Finally, pronoun systems are culture-specific, and an AI providing incorrect advice could inadvertently teach learners to be rude; rigorous testing with native speakers across regions and social settings is essential before deployment.

Conclusion

This study surveyed international learners of Vietnamese to identify where language and culture intersect as barriers to acquisition. Learners report concentrated difficulties: 86% struggle with pronoun selection, 71% with tone discrimination, and listening is the most frequent challenge. Current digital tools are rated highly for vocabulary (4.4) and enjoyment (4.6) but poorly for speaking improvement (3.0). Learners explicitly request more speaking practice and tools targeting fluency. The proposed AI framework – a tone visualizer, pronoun simulator, and adaptive listening integrator – directly addresses these gaps. It is not a substitute for teachers but automates culturally embedded practice that current tools avoid. Whether AI can truly help learners navigate the deep web of language and culture is the question this conference invites us to answer.

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SEMANTIC ANALYSIS OF ENGLISH SPORTS NEOLOGISMS USING NEURAL NETWORKS

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Abstract. The article presents the results of a comparative analysis of the use of DeepSeek and Qwen neural networks in the semantic analysis of English sports neologisms. The specificity of the analysis is to use the linguistic capabilities of the neural networks. The identified problem areas for lexical research are also compared.

Keywords: networks, sports neologisms, semantic analysis, definitions.

СЕМАНТИЧЕСКИЙ АНАЛИЗ АНГЛИЙСКИХ СПОРТИВНЫХ НЕОЛОГИЗМОВ С ИСПОЛЬЗОВАНИЕМ НЕЙРОСЕТЕЙ

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Аннотация. В статье представлены результаты сравнительного анализа использования нейросетей DeepSeek и Qwen в семантическом анализе английских спортивных неологизмов. Специфика проводимого анализа заключается в использовании лингвистических возможностей

нейросетей. Также сопоставлены выявленные проблемные зоны для проведения лексического исследования.

Ключевые слова: нейросети; спортивные неологизмы; семантический анализ; дефиниции.

Introduction

Language is a dynamic system that adapts to social changes. It captures key innovations in various fields (sports, economics, politics, etc.). Currently, the active growth of new sports lexical units is due to the holding of competitions at the international level, the influence of political events on the sports sphere, the emergence of new sports and the updating of the rules of existing sports. Vocabulary replenishment with sports neologisms reflects both linguistic evolution and transformations in society, its relations and values. In addition, the use of neural networks in linguistics contributes to optimization of procedures for processing large amounts of data in the period of digitalization. Neural networks are becoming tools for conducting semantic research through the primary processing of new words in different contexts.

The relevance lies in the study of the adequate reflection of the semantic features of sports neologisms in English using neural networks. The main problems of neural networks remain the issues of recognizing sports neologisms in contexts, taking into account cultural and extralinguistic factors, and analyzing the contextual particularities of functioning new sports lexical units.

The research aim is to compare the DeepSeek and Qwen neural networks in a semantic analysis of English sports neologisms and determine the relevance of their use in conducting lexicosemantic research.

Theoretical framework

On the one hand, a neologism is considered as a new lexical unit that is unique in its form and meaning, and reflects a new object or social phenomenon [9]. On the other hand, a neologism is understood as a lexical unit that is formed by rethinking an established unit, new combinations of morphemes and parts of common words [1].

The variety of new lexical units is determined by the peculiarities of their formation, conditions of use and functional purpose. Consequently, the systematization of neologisms is based on the identification of their fundamental characteristics. In relation to language and speech, neologisms are divided into usual and non-usual (occasionalisms) [5]. Usual neologisms are lexical units that integrate into the general linguistic system to meet the needs of communication in all its spheres. On the contrary, non-usual neologisms arise situationally to solve specific speech problems and retain their novelty regardless of the chronology of their appearance [3]. Neologisms are formed using such word-formation models as word compounding, blending, affixation, conversion, shortening, onomatopoeia, borrowings, semantic derivation, phraseological combinations [8].

As part of the study of languages using neural networks, experts identify semantic research as one of the most perspective areas [4]. Semantic analysis is the complex process, as the neural network recreates the meaning of sentences and text with varying degrees of success, taking into account the word compatibility, a series denotative and connotative meanings, context and associative connections [2]. The classical method of semantic analysis refers to a method of identifying and describing the meanings of a word, formulated and justified by linguistics [7]. A complete description of the lexical system of a language requires constant consideration of everything new in the language. There is an inextricable link between the semantics of a word and the totality of its contextual environments, lexicology and lexicography. Thus, lexicographic description (description of the content and structure of lexicographic meaning) is aimed at identifying the seminal composition of a word [6].

In this regard, the semantic analysis of sports neologisms in neural networks should take into account a component analysis of meaning, semantic relationships within the context, functional-pragmatic aspect, emotivity word-formation criteria. The combination of these factors contributes to the correct interpretation of an English sports neologism in a given textual situation.

Methods and results

In this research, 215 English sports neologisms selected from media sources (BBC Sport, The New York Times, The Guardian, Sunday Sport, The Independent) in the period of 2023-2026 were used as language material. Besides, the DeepSeek neural network language model, trained on extensive text data corpora in multiple languages, as well as the Qwen neural network aimed at text analysis, were used as generative AI systems.

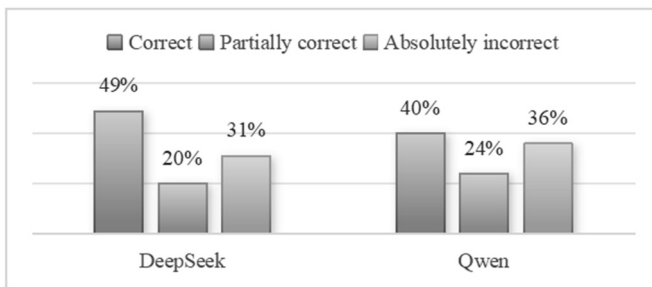
The method of application included several stages. First, specialized prompt was developed – the structured query containing the instruction for identifying the semantic features of sports neologisms in the given contexts. The prompt was formulated as follows: *"To conduct a semantic analysis of a lexical unit "(an English sports neologism)" in the context "(a sports context)"*.

Secondly, each text material with a sports neologism was sequentially introduced into the neural network interfaces along with the developed script. After that, the model performed a comprehensive semantic analysis of a certain lexical unit.

At this stage of the research, the DeepSeek neural network has included in the semantic analysis such aspects as the lexical meaning of a lexical unit in an isolated language system, the semantic structure of the unit (syntagmatic connections, component analysis of meaning), semantic relationships within the context (antonymic/synonymic connections, semantic structure of an action), functional-pragmatic aspect and possible interpretative difficulties. In the semantic analysis of English sports neologisms, the Qwen neural network identified such points as

denotative and connotative meanings, contextual transformation of meaning, semantic compatibility and valence, metaphorical model of the text, pragmasemantics and interpretation options.

Thirdly, the accuracy of definitions of English sports neologisms put forward by DeepSeek and Qwen was analyzed and compared during the semantic analysis (See Pic. 1).



Pic. 1. Definitions of English sports neologisms

The DeepSeek neural network gave the correct meaning to 105 (49%) English sports neologisms, a partially correct meaning to 44 (20%) English sports neologisms, and an absolutely incorrect meaning to 66 (31%) neologisms. The Qwen neural network interpreted 86 (40%) English sports neologisms correctly, 51 (24%) sports neologisms were partially correct, and 78 (36%) neologisms were absolutely incorrect.

The inaccuracy in interpreting the meanings of English sports neologisms is caused by the fact that the semantic analysis of neural networks does not take into account the word-formation features of new lexical units. Both DeepSeek and Qwen have given absolutely incorrect meanings to words that are formed by shortening, onomatopoeia, and conversion. Partially correct definitions were given to words formed using affixation, blending and borrowing. Completely correct definitions were given to words formed by compounding, semantic derivation and phraseological combinations.

In addition, DeepSeek and Qwen have coped with the definitions of the usual English sports neologisms in most cases. In the case of DeepSeek, 79 out of 105 correctly interpreted sports neologisms were made up of usual sports units. Of the 86 correct interpretations in Qwen, 62 sports neologisms belong to the usual sports neologisms.

Conclusion

Despite the comprehensive semantic analysis of English sports neologisms in the DeepSeek and Qwen neural networks, there are significant limitations that prevent

the correct transmission of the meaning of new words. The problematic points in understanding English sports neologisms by neural networks are the close relationship between lexical and semantic variants of a word, the lack of ability to take into account psycholinguistic perception, limited analysis of contextual situations and extralinguistic factors, misunderstanding of the semantic morphemes of new words and the lack of a chronological factor in the development of a lexical unit.

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THE ROLE OF CULTURALLY SIGNIFICANT VOCABULARY ON THE EXAMPLE OF THE TRANSLATION OF SHOLOKHOV M.'S STORY "THE FATE OF A MAN"

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Abstract. This article describes the role of culturally significant vocabulary in conveying national identity and the cultural heritage of a particular country, using Mikhail Sholokhov's short story "The Fate of a Man" as an example. The main challenge in translating this story is analyzing the main character's narrative – it is simple and colloquial, full of words tied to Russian history.

Keywords: interpreting; culturally significant vocabulary; culture; translation; perception; semantics.

РОЛЬ КУЛЬТУРНО-МАРКИРОВАННОЙ ЛЕКСИКИ НА ПРИМЕРЕ ПЕРЕВОДА ПОВЕСТИ ШОЛОХОВА М. «СУДЬБА ЧЕЛОВЕКА»

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Аннотация. В данной статье рассматривается роль культурно-маркированной лексики для передачи национальной идентичности и культурного наследия нашей страны на примере рассказа Михаила Шолохова «Судьба человека». Главной трудностью при переводе этого рассказа является анализ особенностей повествования главного героя – оно написано простым языком, содержит много разговорных слов и отсылок на события русской истории.

Keywords: перевод; культурно-маркированная лексика; культура; восприятие перевода; семантика.

Introduction

Culturally significant vocabulary is a linguistic phenomenon that includes various lexical units connected with historical events, common life traditions and cultural background of a country. This vocabulary has not only descriptive function,

but a special semantic meaning being a key to distinguishing between nations and cultures. Interpreting such vocabulary may be challenging because it contains elements of everyday life and identity that lack direct equivalents in other languages. Researchers argue that successful international communication requires in-depth knowledge of historical and cultural spheres and not only a high qualification in translation. In world literature, culturally significant vocabulary plays an important role by creating a special national image and helping us understand each other better. That is why it is a difficult task to translate culturally significant vocabulary; it is necessary to ensure accurate perception in spite of linguistic obstacles like pragmatics, stylistics and semantics.

Theoretical framework

There are essential strategies for translating culturally significant vocabulary – domestication and foreignization. Domestication focuses on adapting vocabulary to make it familiar to the reader in order to preserve equivalent perception. Foreignization, by contrast, focuses on keeping a distance between the reader and the author by saving the original lexical units.

Scientists Florin and Vlakhov provided a classification of such vocabulary. According to them, there are three categories of cultural realities – geographic, ethnographic and social-political [6]. There are also numerous translation strategies. For example, transliteration and transcription are used in cases involving phonetic adaptation. Functional equivalents help readers to understand and feel the text better, but of course there is a risk of loss of cultural specificity [6].

Methods and results

There are three examples of translating culturally significant vocabulary from “The Fate of a Man” [3]:

Большая вода – *Big river*

The phrase *big river* may seem like a simple geographic description, but it actually strips away a deeper layer of cultural meaning. In Russian, *большая вода* carries specific weight – it refers to the spring flood, a powerful natural cycle that both destroys and renews the land [4]. This is not just a location; it is an event rooted in folklore, symbolizing nature's force and the human experience of living alongside it.

Calling it *big river* turns something dynamic into something static, and the foreign reader loses that connection. A better option, such as *high water* [1], at least hints at the original meaning and preserves that sense of nature in motion.

Самосад – *Home-made tobacco*

Самосад is a word that carries more than its dictionary definition. Translating it as *home-made tobacco* hides the lore of Russian heritage. In Sholokhov's story, this word quietly speaks to resilience. Options like *coarse home-grown tobacco* or even the period-specific term *shag* do a better job of carrying that sense of grit and survival across into English [1; 2; 5].

Плотницкая артель – *Carpenter*

This unit seems to be the hardest to translate. When *работал в плотницкой артели* becomes simply *worked as a carpenter*, an entire social institution disappears. The word *артель* describes a specific kind of work collective – rooted in mutual responsibility, shared risk, and craft brotherhood. It was central to how people organized themselves in pre-Soviet and Soviet times.

Reducing it to an individual profession erases that context entirely. Variants like *in a carpentry artel* or just *in a carpentry cooperative* would convey the main idea of this type of job better. Understanding the atmosphere of collective work in the Soviet Union is essential for the reader to feel those times.

Conclusion

Translating culturally significant vocabulary is not limited to conveying semantics; the most crucial aspect is considering the reader's perception and selecting appropriate equivalents.

The translator should consider the context of the story and try to preserve the original cultural heritage. The examples presented in the article show how important it is to maintain a balance between understanding and perception of the text. These lexical units tend to contain memories, history, and pride, and the main aim is to choose the most appropriate word combinations and structures that best fit each individual case.

Sholokhov's story makes a significant contribution to Russian history because it depicts events that should never be repeated. And if we want to share this idea with other people, good and understandable translation is necessary. Translation, then, becomes an act of cultural mediation, one that balances fidelity to the original with accessibility for the new audience, and in doing so, keeps the memory alive.

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AI CHANGING TRANSLATION PRACTICE AND RESEARCH

METHODS OF TRANSLATING GENDER-NEUTRAL LEXIS FROM ENGLISH INTO RUSSIAN

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Abstract. The aim of the study was to review the methods of translating gender-neutral lexis from English into Russian. The article identifies three translation methods: grammatical number substitution, the use of the masculine gender as a generic form, and the use of feminatives to indicate the female gender of the referent.

Keywords: gender-neutral language; neutralization; singular they; feminatives; gender.

СПОСОБЫ ПЕРЕДАЧИ ГЕНДЕРНО-НЕЙТРАЛЬНОЙ ЛЕКСИКИ С АНГЛИЙСКОГО ЯЗЫКА НА РУССКИЙ

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Аннотация. Целью исследования был обзор способов передачи гендерно-нейтральной лексики с английского языка на русский. В статье выделены три способа передачи: грамматическая замена числа, использование мужского рода как обобщающего и применение феминитивов для указания на женский пол референта.

Ключевые слова: гендерно-нейтральный язык; нейтрализация; singular they; феминитивы; род.

Introduction

Gender-neutral lexis is actively used in English discourse to avoid discrimination, which creates difficulties when translating into Russian due to the presence of the grammatical category of gender in Russian. Despite existing works in gender linguistics, comprehensive review studies on the methods of translating such vocabulary are insufficient. The aim of this work is to systematize the main methods of translating gender-neutral units from English into Russian.

Theoretical framework

The basis for this review was provided by works on gender linguistics (A. V. Kirilina) and translation theory (V. N. Komissarov, M. Y. Blokh). In Russian linguistics, the problem of translating gender-neutral units is most often examined in the context of translating feminatives or the pronoun "singular they." Researchers agree that direct equivalent translation is impossible. According to E. I. Goroshko, the term "gender-neutral language" emerged within the feminist movement in linguistics [3]. A. S. Koshmina, N. I. Vlasenko, and E. D. Kovaleva offer a structural definition: gender neutrality involves removing the emphasis on gender by neutralizing markers of masculinity or femininity [5]. Thus, gender-neutral lexis refers to units that allow referring to persons of any gender without indicating their gender identity.

As M. Y. Blokh notes, the main difference is that in English the grammatical category of gender is practically absent in nouns, whereas in Russian gender is an obligatory category permeating nouns, adjectives, pronouns, and past-tense verbs [2]. It is this that creates the main difficulty: what is expressed lexically or contextually in English must be expressed grammatically in Russian, which leads to a loss of neutrality.

Based on this, the study applies the classification of transformations proposed by V. N. Komissarov: grammatical and lexical transformations [6].

Methods and results

The methods of continuous sampling and comparative analysis were used. The material consisted of English-language news articles ("The Washington Post," "The New York Times," "Space," etc.) and their translations into Russian ("InoSmi," "Vesti.Ru"). A total of 16 gender-neutral lexical units were examined. During the preliminary analysis, three main methods of translation were identified:

- Transforming "singular they" into the plural [1].
- Using the masculine gender as a generic neutral form (generalization) [7].
- Using a feminative to mark the female gender of the referent (specification).

Below are examples illustrating the main methods of translating gender-neutral lexis from English into Russian:

(1) *“If a user wants to remain anonymous, they must be careful.”* – *“Если пользователи хотят остаться анонимными, они должны быть осторожны”*.

In English, «singular they» avoids indicating gender (he or she). In Russian, grammatical gender is obligatory, and the singular form automatically marks masculinity. Translators replace the singular with the plural, where gender is not expressed. This neutralizes the gender reference while preserving meaning but changes the number of the referent.

(2) *“In the United Kingdom, retired firefighters have recently accused the Gloucestershire Fire and Rescue Service of being “institutionally racist”.* – *“Недавно в Великобритании пожарные в отставке обвинили пожарно-спасательную службу Глостершира в “институциональном расизме”*.

The word «firefighter» is gender-neutral in English. In Russian, the word «пожарный» exists only in the masculine form (there is no commonly used feminine «пожарная» in the same professional meaning). Translators use generalization: the masculine gender serves as a generic (generalizing) form for all persons in the profession.

(3) *“In fact, Adelia was the first Russian skater to perform in an international competition since the 2022 Beijing...”* – *“Фактически, она стала первой российской фигуристкой, выступившей на международных соревнованиях после Олимпийских игр в Пекине в 2022 году”*.

The English «skater» is gender-neutral, but the name and context indicate a woman. In Russian, the translator chooses the feminine «фигуристка» to agree the gender with the verb and pronoun. This not only translates but also emphasizes the female gender of the referent, unlike the neutral original.

(4) *“One pilot in the 588th Regiment, Klavdia Deryabina, said in a 2005 interview that speaking about the civilian victims or the mistakes was taboo in the Soviet era.”* – *“В 2005-м году одна из летчиц 588-го полка Клавдия Дерябина в интервью заявила, что в советское время разговоры о жертвах среди гражданского населения и о просчетах были запрещены.”*

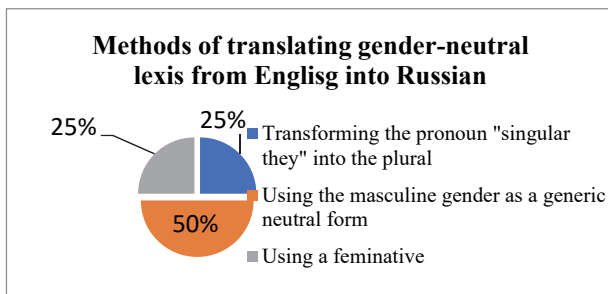
«Pilot» is gender-neutral. However, the name and historical context (a female aviation regiment) require indicating the female gender. The construction «one of the female pilots» is a feminine. The translator specifies the gender although the neutrality of the English «pilot» is formally lost.

(5) *“The harnesser, by contrast, is far more than a critical thinker. They can turn an impossible situation into a creative opportunity.* – *Укротитель, напротив, – это нечто гораздо большее, чем просто критический мыслитель. Он способен превратить безвыходную ситуацию в творческую возможность.”*

In English, «harnesser» has no grammatical gender markers, and the pronoun «they» does not indicate the referent's gender. In Russian, the corresponding noun

«УКРОТИТЕЛЬ» belongs to the masculine gender. The translator resorts to generalization, using the masculine gender as neutral by default, and chooses the pronoun «he» because it is the only grammatically congruent option in Russian.

Analysis of several articles revealed the following distribution of translation strategies (see Pic. Methods of translating gender-neutral lexis from English into Russian): pluralization of "singular they" accounts for 25% of cases; use of feminatives (specification) also 25%; and use of the masculine as a neutral/generalizing form (generalization) is the most frequent, representing 50% of cases. Thus, generalization accounts for half of all cases, while the other two strategies each occur in about a quarter.



Pic. 1. Methods of translating gender-neutral lexis from English into Russian

Conclusion

The analysis shows that translating gender-neutral lexis from English into Russian is complicated by a grammatical discrepancy: gender is absent in English nouns but obligatory in Russian. Direct equivalent translation is therefore impossible. Three main strategies were identified: number substitution (pluralizing "singular they"), generalization (masculine as generic form), and specification (using a feminine). None is universal; the choice depends on the unit type, existing feminatives, and context. Constructions with "singular they" and profession names without neutral Russian equivalents are the most difficult. All three methods involve semantic or stylistic losses, highlighting the need for flexible strategies.

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THE USE OF ARTIFICIAL INTELLIGENCE FOR THE TRANSLATION OF SPECIALIZED TEXTS IN THE FIELD OF TELECOMMUNICATIONS

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Abstract. The study analyzes the quality of neural machine translation for specialized telecommunications texts, comparing Google Translate and Yandex Translate. Using the MQM framework to classify errors, the research reveals that both systems frequently make critical terminological and syntactic mistakes.

Keywords: Artificial Intelligence (AI); neural machine translation; MQM analysis; error; classification.

ПРИМЕНЕНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА ДЛЯ ПЕРЕВОДА СПЕЦИАЛИЗИРОВАННЫХ ТЕКСТОВ В ОБЛАСТИ ТЕЛЕКОММУНИКАЦИЙ

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Аннотация. В исследовании анализируется качество нейронного машинного перевода специализированных телекоммуникационных текстов, выполненного Google Translate и Yandex Translate. Анализ MQM позволил классифицировать ошибки в переводах и установить, что обе системы часто допускают критические терминологические и синтаксические ошибки.

Ключевые слова: искусственный интеллект (ИИ); нейронный машинный перевод; анализ MQM; ошибка; классификация.

Introduction

The evolution of artificial intelligence (AI) has positioned machine translation as a cornerstone of computer-aided translation. Tools like Google Translate, Baidu Translate and Yandex Translate offer considerable convenience owing to their accessibility, relative efficiency, ability to process large volumes of text rapidly and possibility of translation into several languages. Yet, the integration of AI into translatory practice raises several questions and demands careful analysis.

This study aims to identify and systematize the errors and inaccuracies observed in translations produced by Russian and English neural networks. To achieve this, the following steps have to be undertaken: 1) selecting telecommunications texts for the analysis; 2) translating the selected texts by means of Google Translate and Yandex Translate; 3) detecting, analyzing and classifying translation errors and inaccuracies; 4) analyzing the feasibility of using machine translations in professional activities without additional editing of specialized telecommunications texts. The object of the study is represented by the translated texts of the articles published in open access journals on telecommunications and extracted from the website IEEE Open. The subject of the study is the errors detected in the translated texts.

Comparing telecommunications text translations produced by Google Translate and Yandex Translate has several practical implications: 1) either of these systems is trained on its own dataset, so the same specialized vocabulary may be translated differently; 2) a specific task might require a suitable tool, e.g. it is believed that Yandex suits for working with Russian-language documentation, while Google is better for working with international standards; 3) translation analysis demonstrates which system requires human post-editing and to what extent it has to be implemented.

Theoretical framework

Neural Machine Translation (NMT) represents a modern approach to automatic text translation, leveraging deep neural networks and artificial intelligence. NMT's powerful generative capabilities and profound contextual understanding have established it as the leading approach in recent years. By analyzing huge amounts of language material, neural networks learn language models and patterns, which allows them to generate high-quality text [4, p. 48]. In addition to machine translation, artificial intelligence technologies are also actively used as auxiliary tools. Such CAT (Computer-Assisted Translation) tools as *SDL Trados* and *MemoQ* help translators to quickly find and use professional vocabulary owing to the integrated term bases. Translation quality assessment tools, e.g. *Xbench* and *Verifika*, automatically check and evaluate the text, helping translators identify hidden errors and inaccuracies, thereby improving the quality of work.

Regarding the areas in which AI-based translation technologies are especially in demand, the fields of science, technology and business have to be considered. NMT tends to be effective in conveying information and can be made use of wherever new knowledge is important [2, p. 123], which makes it suitable for translating specialized telecommunications texts. It is considered that "the main task of the translator is to create a text that would be useful to the recipient in the framework of their activities...and the main goal of the recipient is to extract information from the text that is useful for carrying out substantive activities" [3, p. 79].

Particular attention should be paid to the quality of technical information transfer when translating texts in the field of telecommunications. As was stated in [1], there are a few types of technical translation in terms of its quality: 1) a high-quality translation which complies with the language norm of the target language and is devoid of translation additions or omissions that may distort the author's meaning; 2) a complete translation which meets all the requirements for a high-quality translation and, in addition, includes additional work to eliminate the errors and illogicalities of the original author, clarify the author's meaning and construct equivalents for terms missing from dictionaries; 3) an interlinguistic translation which is a complete translations accompanied by editing the source text with the aim of improving it in terms of clarity and logic [1, p. 73].

Several key factors determine the quality of technical translation performed by AI. These include accurate and consistent terminology, correct grammar and syntax, preservation of meaning and appropriate style. Neural networks must be able to process complex sentences with passive constructions, participial and adverbial clauses correctly without losing the logical flow. The translation must accurately convey the original information. This is especially important for negatives, modal verbs (must, should, may) and quantitative data. In addition to the linguistic accuracy,

an adequate AI translation should be devoid of colloquialisms, metaphors, and subjective opinions because technical style is characterized by impersonality, objectivity, and a lack of emotional language. The same terms and sentence structures ought to be translated consistently throughout the document. Apart from that, translation may require adapting units of measurement (e.g., inches to millimeters), date formats, or specific customer requirements. AI models trained on large amounts of technical texts tend to perform well owing to their integration with external term bases (TB) and Translation Memory (TM).

Methods and results

The empirical foundation of this research comprises the original texts of five articles on 5G development (totaling 42,749 words) and their Russian translations which were produced using Google Translate and Yandex Translate. The analysis process was divided into three stages: detection (finding errors); classification (determining the error type); quantitative evaluation. We compared the neural machine translations with the original by analyzing each sentence for inaccuracies, distortions, omissions and additions. As a supplement of the human-made analysis, Verifika, a QA (Quality Assurance) tool, was used to check completeness of the translations, the presence of key terms, compliance of the numbers and units of measurement and formal errors like incorrect punctuation or double spaces. Further, the MQM (Multidimensional Quality Metric) Annotation Tool by Alconost was employed to divide errors into several levels.

According to A. Lommel et al., “the central component of MQM is a hierarchical listing of issue types...and the errors are seen as deviations from a text that fully complied with specifications” [5, p. 456]. It is noteworthy that errors not leading to a deviation from specifications are not counted: for example, if specifications for a service manual state that stylistic concerns are not important, poor style would not be counted as an error, even though incorrect terminology would be.

The main categories of errors singled out by MQM include accuracy, fluency, terminology and formatting parameters. The accuracy parameter is aimed at detecting additions (i.e. the translation contains information that is not in the original), mistranslations (i.e. incorrect conveyance of the meaning of a term or fact) and omissions (i.e. the loss of important information from the original. The fluency parameter concerns grammar (e.g. errors in agreement, cases and tenses), syntax (e.g. incorrect word order or sentence structure), style and register (e.g. inconsistency with the original style such as an overly colloquial tone in a scientific text). The terminology parameter addresses inconsistencies with the domain, e.g. usage of a term from another field, or introduction of neologisms and occasionalisms, e.g. creation of a non-existent word in place of an existing term. Lastly, formatting concerns errors in markup, tags and formatting of lists and tables.

After classification, each error is assigned a weight based on its severity: 1) neutral errors are stylistic imperfections that do not affect comprehension; 2) minor errors require editing but do not distort the meaning; 3) major errors distort the meaning or violate the grammar, which impedes comprehension; 4) critical errors lead to a complete loss of meaning or serious factual errors [5, p. 460–461].

Based on the results of MQM analysis, the following examples of errors were detected in the texts translated by Google, with a total number of errors amounting to 103 (see Table 1).

Table 1

Classification of errors made by Google Translate

Error example (original text sample)	Error type	Category	Weight	Comment
<i>unreliable handoff</i> → <i>ненадежная передача</i>	mistranslation	accuracy	critical	The substitution of the specialized term “handoff” for the general term “transfer” distorts the technical essence of the process.
<i>voice calls were played back</i> → <i>голосовые вызовы воспроизводятся</i>	mistranslation	accuracy	major	A calque had to be replaced by « <i>передаются</i> ».
<i>Orthogonal Frequency Division Multiple Access (OFDMA)</i> → <i>ортогональное частотное мультиплексирование</i>	terminology	terminology	critical	The terms <i>multiplexing</i> and <i>multiple access</i> are confused. In telecommunications, these are different technologies.
<i>The 3G’s expanded information transmission abilities multiple times quicker than 2G</i> →... <i>возможности в несколько раз быстрее, чем в 2G</i>	syntax	fluency	major	There is an agreement error: abilities cannot be quicker. The speed of 2G was meant.
<i>It has low capacity...</i> → <i>Он имеет низкую пропускную способность...</i>	grammar	fluency	minor	There is a pronoun agreement error with “it” (a network is feminine in Russian).

As a result of the analysis, the following examples of errors were detected in the texts translated by Yandex, with their total number amounting to 82 (see Table 2).

Table 2

Classification of errors made by Yandex Translate

Error example (original text sample)	Error type	Category	Weight	Comment
<i>The discounts on the construction cost... → Скидки на стоимость строительства...</i>	mistranslation	accuracy	minor	The word “discounts” is used figuratively. “Cost reductions” were implied in the context.
<i>...the cost is directly proportional to the energy... → ...стоимость напрямую связана с энергией...</i>	mistranslation	accuracy	minor	In the context of technology, dependence on “energy inputs,” not on physical “energy” is spoken of.
<i>...virtual evolved packet core (vEPC)... → ... виртуальное развитое ядро пакетной сети (vEPC)...</i>	terminology	terminology	minor	The word “evolved” in Russian is redundant, as it is part of the standard name (EPC).
<i>...the system comprising of a major consumer terminal... → ... система состоит из основного потребительского терминала...</i>	syntax	fluency	major	The error was caused by incorrect syntactic parsing of the sentence containing a participle.
<i>It provides the facility of SMS... → Он предоставляет возможность отправки SMS...</i>	grammar	fluency	minor	There is a pronoun agreement error with “it” (a network is feminine in Russian).

A statistical method was employed to compare the error rates of Google Translate and Yandex Translate. The total pool of detected mistakes was normalized to 100%. The results demonstrate that both services perform poorly with highly specialized vocabulary (30% of terminological errors in both Yandex and Google translations). Yandex more often preserves the original structure, which leads to grammatically incorrect constructions (40% of syntactical errors) while Google more often breaks sentences and does so more effectively (25% of syntactical errors). Both services

allow basic grammatical errors (noun gender, agreement), but their number is comparable (15% of grammatical errors for both services). Google allows mistranslations that completely change the perception of the text (30% of errors) while Yandex is more careful in this regard (15% of errors). The majority of detected errors fall into major and minor categories, with neutral errors being absent. Critical errors constitute approximately 18% of all identified mistakes.

Conclusion

An analysis of translations performed by Google Translate and Yandex Translate revealed that, despite significant advances in artificial intelligence, the current state of machine translation does not allow its results to be used professionally without mandatory editorial editing. Both systems demonstrate low performance when working with terminology, which is the core of any technical text. Critical errors in conveying the meaning of terms were recorded in 30% of cases for both platforms. This indicates that training neural networks on general language corpora does not provide a sufficient level of competence in narrow subject areas. To produce a high-quality product that meets the requirements of accuracy, unambiguity, and compliance with industry standards, machine translation requires mandatory post-editing by a subject matter expert.

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TRANSLATING ENGLISH SLANG INTO RUSSIAN WITH AI: THE ROLE OF HUMAN POST-EDITING

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Abstract. The aim of the research is to analyze the effectiveness of automated translation of English slang into Russian using artificial intelligence (AI) systems and to determine the role of human in post-editing such translations. The research reveals the main types of errors made by AI when translating slang and substantiates the necessity of mandatory post-editing to achieve an adequate translation.

Keywords: slang; artificial intelligence; machine translation; post-editing; translation theory.

ПЕРЕВОД АНГЛОЯЗЫЧНОГО СЛЕНГА НА РУССКИЙ ЯЗЫК С ПОМОЩЬЮ ИИ: РОЛЬ ЧЕЛОВЕКА В ПОСТРЕДАКТИРОВАНИИ

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Аннотация. Целью исследования является анализ эффективности автоматического перевода англоязычного сленга на русский язык с помощью систем искусственного интеллекта (ИИ) и определение роли человека в постредактировании таких переводов. В результате исследования выявлены основные типы ошибок, допускаемых ИИ при переводе сленга, и обоснована необходимость обязательного постредактирования для достижения адекватного перевода.

Ключевые слова: сленг; искусственный интеллект; машинный перевод; постредактирование; теория перевода.

Introduction

Slang is one of the most dynamic – and at the same time one of the most challenging – lexical layers to translate in any language. As V. A. Knomyakov notes, slang is “the main component of English nonstandard colloquial speech” and is characterized by “expressiveness, evaluative meaning, and stylistic lowering”

[1, p. 23]. A comparison of the literary standard with informal language varieties shows that their rates of renewal are not comparable: according to lexicostatistical studies, 40% of slang units fall out of active use within 10-15 years.

Against the background of the rapid development of artificial intelligence (AI) and machine translation (MT) systems, a natural question arises: is AI able to adequately convey the meaning and stylistic coloring of slang units? The relevance of this study is due to the increasing use of automated translation systems in everyday practice, while the specifics of AI performance on slang remain insufficiently studied. Most existing studies focus on the translation of terminology or general vocabulary, while slang, due to its non-standard nature, is a “risk zone” for MT.

Theoretical framework

The theoretical framework of the research includes works in translation theory (V. N. Komissarov, A. D. Shveitser, Ya. I. Retsker), studies of slang (J. C. Hotten, V. A. Khomyakov, I. V. Arnold), as well as contemporary studies on MT and post-editing (K. Gerloff, J. Kirsch). V. N. Komissarov defines translation as “a complex type of linguistic mediation,” in which the key task is to render the content of the source text as fully as possible while observing the norms of the target language” [2, p. 34]. He also distinguishes five levels of translation equivalence, among which the most significant for slang is the pragmatic level, associated with conveying communicative effect.

As early as 1860, J. C. Hotten, in “A Dictionary of Modern Slang”, noted that understanding slang requires not only knowledge of the language but also a deep awareness of the cultural context [6]. A. D. Shveitser, studying the American variety of English, emphasizes that slang is often based on metaphorical transfer and culturally specific imagery, which makes its formalized translation especially challenging [5, p. 78].

With regard to MT and post-editing, the most influential studies include those by P. Koehn, one of the developers of statistical MT, who demonstrated that MT systems are “trained” on text corpora that largely consist of literary and official-business vocabulary [7]. In a review of post-editing studies, M. Koponen concluded that even the best MT systems produce up to 15–20% semantic errors when translating stylistically marked vocabulary, and correcting one such error takes a post-editor on average 1-2 minutes [8].

Methods and results

An experiment was conducted in which 30 slang units from modern English (including examples taken from fiction, films, and online communication) were translated by three widely used AI-based translation systems (Google Translate, DeepL, and Yandex Translate). The slang expressions were divided into 5 thematic categories:

- Finance and money (*bread, dough, bucks, cash*);
- Evaluation and emotions (*lit, salty, shady, cringe, woke*);
- Internet slang (*cringe, LOL, OMG, IRL*);
- States and actions (*flex, chill, crash, binge-watch*);
- Forms of address and personal characteristics (*bro, dude, nerd, jerk, creep*).

The obtained translations were compared with “reference” translations previously proposed by professional translators.

The findings showed that the most frequent AI translation errors were as follows (see Table 1).

Table 1

Experiment results

Error type	Share of total errors	Example
Literal translation	42%	«Lit» rendered as «освещённый» instead of «крутой/зажигательный»; «Salty» – «соленый» instead of «раздраженный».
Stylistic neutralization	28%	«Bread» rendered as «хлеб» instead of the slang «бабло»; «Dough» – «место» instead of «деньги».
Context neglect	18%	«Ghosting» rendered as «привидение» instead of «игнорирование сообщений»; «Flex» – «сгибать» instead of «хвастаться».
Misrepresentation of pragmatic meaning	12%	«Cringe» rendered as «съежиться» instead of «испанский стыд»; «Woke» – «проснувшись» instead of «социально сознательный».

The AI systems performed best (approximately 60% accurate translations) when translating conventional slang items that are already recorded in dictionaries (e.g., “cool” – “крутой”). Among the three systems, DeepL produced the best results (35% adequate translations), while Yandex Translate produced the weakest results (only 22%).

At the same time, all systems demonstrated an inability to translate author-specific slang as well as highly metaphorical slang (e.g., “to spill the tea” – meaning “сплетничать/распускать сплетни” – was translated literally as “пролить чай”). The share of adequate translations for such items did not exceed 25%.

In addition, post-editing time was analyzed: on average, a professional translator spent 45 seconds correcting a MT of a slang unit, whereas translating from scratch

took about 25 seconds. This means that post-editing slang translations does not speed up the translator's work, but on the contrary, it slows it down, because it requires not merely replacing a word but rethinking an entire fragment. This contradicts the widespread assumption that MT always saves time.

Conclusion

The study leads to the conclusion that contemporary AI systems are still incapable of producing an adequate independent translation of English slang, especially of context-dependent and culturally marked elements. The main reasons include the lack of background knowledge, the inability to recognize the pragmatic potential of slang, and a tendency toward literalism. Therefore, the role of a human post-editor is not merely desirable but essential. A post-editor must not only correct factual errors but also restore stylistic coloring, choose functional analogues in the target language, and take the communicative situation into account. In the long term, scientific research should begin to focus on developing algorithms that enable AI to identify the pragmatic markers of slang.

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COMPARATIVE ANALYSIS OF THE QUALITY OF RUSSIAN-ENGLISH MACHINE AND TRADITIONAL TRANSLATION OF ELECTRONICS USER MANUALS

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Abstract. The article compares machine and professional translation of Russian electronics user manuals into English. Machine translation errors include terminological inconsistencies, logical violations, and pragmatic distortions. Functional adequacy of raw machine translation does not exceed 40%.

Keywords: machine translation; user manual; neural machine translation system; terminological accuracy; post-editing.

СРАВНИТЕЛЬНЫЙ АНАЛИЗ КАЧЕСТВА РУССКО-АНГЛИЙСКОГО МАШИННОГО И ТРАДИЦИОННОГО ПЕРЕВОДА ИНСТРУКЦИЙ ПО ЭКСПЛУАТАЦИИ ЭЛЕКТРОНИКИ

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Аннотация. В статье сравнивается машинный и профессиональный перевод русскоязычных инструкций по эксплуатации электроники. Ошибки машинного перевода включают несоответствия и нарушения логики. Функциональная адекватность машинного перевода не превышает 40%.

Ключевые слова: машинный перевод, инструкция, нейросетевые система перевода, терминологическая точность, постредактирование.

Introduction

In the context of rapid globalization of the consumer electronics market and the active integration of artificial intelligence systems into translation practice, the problem of assessing the quality of machine translation (MT) of specialized texts becomes particularly relevant. Electronics user manuals represent a functionally significant type of directive technical documentation, the main task of which is to ensure correct and safe use of devices [2, p. 128]. Any distortions or inaccuracies in the translation of such texts can lead not only to a decrease in ease of use but also to potential risks

for the user. Researchers point to the continuing limitations of automatic systems, especially noticeable when translating highly specialized instructions that require strict terminological consistency, adherence to genre norms, and functional adequacy [4, p. 4454].

Literature review

The user manual as a genre of technical discourse is characterized by a number of stable linguistic features. At the terminological level, this is manifested in the dominance of highly specialized, standardized vocabulary and stable clichéd formulas that ensure instant recognition of key prescriptions [1, p. 26]. The syntactic structure of technical documentation texts is oriented towards clarity and imperativity, which is expressed in the predominance of imperative constructions and modal verbs of obligation [3, p. 63]. In the era of digitalization, the Internet has become the main communication channel between manufacturers and users, where multilingual instructions provide global access to technical information [5, p. 218]. NMT systems work with whole sentences using an encoder-decoder architecture with an attention mechanism, which allows them to take context into account when generating translation [6, p. 100]. However, as researchers note, NMT faces challenges that are particularly critical for technical texts: translation of rare and highly specialized terms.

Methods and results

The research material consisted of a corpus of 20 user manuals for electronic devices of various types: household appliances audio and video devices, kitchen electronics. The total volume of the corpus was about 25,000 word usages. The sources of the material were official manufacturer websites and specialized online catalogs of technical documentation. For each instruction, the Russian original and an official or professional English translation were used, which ensured data comparability [3, p. 217]. At the first stage, a corpus of texts was formed according to genre and functional characteristics. At the second stage, machine translation of the Russian instructions was carried out using four neural network systems: Google Translate, DeepL, etc.

The assessment was carried out using the method of expert analysis with comparison to professional translations and subsequent statistical data processing. The study found that machine translation demonstrates a high speed and correctly conveys the general structure of instructions in 85% of cases. However, the level of complete functional adequacy without post-editing does not exceed 40%. The English normative formulation "*Ensure that the loading door is firmly closed before starting the wash cycle*" (instruction for Candy washing machine) was rendered in machine translation as «Перед началом стирки убедитесь, что загрузочная дверь плотно закрыта». This variant demonstrates the use of the lexeme "дверь" (door), which is atypical for Russian-language instructions, instead of the normative term

"люк" (porthole/door). In the professional translation, this fragment is rendered as «Перед началом стирки убедитесь, что загрузочный люк плотно закрыт», where terminologically fixed lexicon corresponding to the genre requirements of user manuals is used. In Candy instructions, in 70% of the analyzed cases, machine translation weakened the imperative structure of the source text. The English imperative "Never leave the appliance unattended while in operation" was rendered as «Прибор не следует оставлять без присмотра во время работы». The use of the modal construction "не следует" (should not) gives the utterance a recommendatory character. In professional translations, on the contrary, the imperative structure was preserved: «Не оставляйте прибор без присмотра во время работы». Comparison of machine translation systems showed that DeepL and Google Translate handle syntax and common vocabulary better but are inferior to PROMT in cases where terminological consistency is required. For example, the term "панель управления" was rendered uniformly by all tested systems (*control panel*), but specific terms such as "табло индикации" or "поворотный переключатель" were translated variably: from *indicator display* to *display screen*. Quantitative analysis of errors in a corpus of 60 key fragments allowed us to establish the following distribution, see table below.

Distribution of error types in machine translation

Error type	Appearance, %
Terminological inconsistencies	65
Violations of the logic of instructional sequences	20
Distortion of pragmatic orientation	15

As can be seen from the presented data, the most vulnerable aspect of machine translation is the transfer of special vocabulary. This is explained by the fact that neural network models are trained on general corpora of texts, where terms can appear in various, sometimes contradictory contexts.

Conclusion

The conducted research allows us to conclude that modern MT systems demonstrate high efficiency. For the preparation of final versions of instructions intended for the end user, mandatory editorial processing by a professional translator is necessary. The most effective appears to be a hybrid translation model that combines the capabilities of neural network systems and professional post-editing.

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PROFESSIONAL TRANSLATOR VS. ARTIFICIAL INTELLIGENT: A COMPARATIVE ANALYSIS OF TRANSLATION STRATEGIES IN A POPULAR SCIENCE TEXT ON PSYCHOLOGY

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Abstract. The article examines and compares two types of translation of a popular science text on psychology: translation made with AI and human-translator's translation. Special attention is paid to translation strategies.

Keywords: popular science translation; comparative analysis; translation strategies; domestication and foreignization.

ПРОФЕССИОНАЛЬНЫЙ ПЕРЕВОДЧИК И ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ: СОПОСТАВИТЕЛЬНЫЙ АНАЛИЗ СТРАТЕГИЙ ПЕРЕВОДА НАУЧНО-ПОПУЛЯРНОГО ТЕКСТА ПО ПСИХОЛОГИИ

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Аннотация. В статье рассматриваются и сравниваются два вида перевода научно-популярного текста по психологии: перевод, выполненный с помощью ИИ и перевод человека-переводчика. Особое внимание уделяется стратегиям перевода.

Ключевые слова: научно-популярный текст; сопоставительный анализ; переводческие стратегии; доместикация и форенизация.

Introduction

Contemporary translation practice is undergoing a phase of technological transformation: artificial intelligence systems are increasingly viewed not merely as auxiliary tools but as potential alternatives to human translators. Neural machine translation algorithms demonstrate high efficiency when handling information-dense texts, yet the question of how effectively they can compete with professionals in genres requiring nuanced stylistic and cultural adaptation remains a matter of debate.

Theoretical framework

Translators cannot simply consider cultural factors when translating texts. Typology, stylistic features, and structure of the source text are supposed to be taken into account. Traditionally, linguistics distinguishes between scientific, formal, journalistic, colloquial, and literary styles. The translator's task is to be able to characterize the texts being translated in terms of their functional styles and to pay attention to the texts' properties.

The popular science text occupies a borderline between the purely scientific and the journalistic styles. Based on the purpose of communication (awakening interest in a certain area and a simple explanation of its basic features) and the way in which communication takes place among the author and the reader (the process of reading a book), we can conclude that the style should have simplicity, clarity and expressiveness of language. And though translating such types of texts has always been a part of a translator's job, sometimes it is complicated to work with them. This may be due to various factors: incorrect interpretation of terminology and a lack of understanding of the meaning of the source text and so on [3, p. 8].

Lawrence Venuti, an American translation theorist, was the first to introduce the terms domestication and foreignization, which denote two directly opposing translation strategies that a translator employs when dealing with linguistic and cultural challenges. Venuti argued that “domestication is an ethnocentric approach in which the source text is often preserved, the emphasis is placed on the cultural values of the target language, and the ‘author is brought closer to the reader’; foreignization is an approach in which the emphasis is placed on preserving foreign linguistic and cultural values, while the ‘reader is brought closer to the author’” [4, p. 3].

Methods and results

The material for the comparative analysis is the chapter “The Lazy Controller” from Daniel Kahneman's “Thinking, Fast and Slow” (the original text) [1, p. 40], as well as two Russian translations: a professional translation produced by the Bakanov School of Translation, 2013 (A. Andreev, N. Parfenova, Yu. Deglina) [2, p.43], and an automated translation generated by the neural network model "Alice" (Yandex AI). The updated version of "Alice AI" presented by Yandex in October 2025 was used. Its task was to translate the text from English into Russian, and no post-editing was performed.

The most frequent, most salient cases were selected and an analysis was conducted. Both translations make skillful use of equivalent terminology in psychology, pointing to the presence of stable term pairs in AI training corpora (see Table 1)

Table 1

Comparative analysis of equivalent correspondences

The original text	by professional translators	By Alice AI
Mihaly Csikszentmihalyi	Михай Чиксентмихайи	Михай Чиксентмихайи
System 2	Система 2	Система 2

Professional translation prioritizes the conciseness and natural flow typical of Russian popular science writing. AI, by contrast, tends toward explicitness, adding clarifications that increase text length without necessarily improving quality (see Table 2).

A professional translator shows greater flexibility in using contextual substitutions, adapting metaphors and figurative language to fit the linguistic and cultural norms of Russian. AI, on the other hand, retains the original metaphorical structure, which in some cases results in unnatural phrasing or literalism (see Table 3).

The professional translation makes active use of grammatical transformations (replacing passive constructions with active ones, converting complex sentences into simple ones) as well as lexical transformations (substitutions and omissions) to adapt the text to the norms of the Russian language.

Table 2

Comparative analysis of alternative correspondence

The original text	by professional translators	By Alice AI
strain	напряжение	напряжение / внутреннего конфликта
construct an intricate argument	построить сложную цепочку аргументов	построить сложный аргумент

Table 3

Comparative analysis of contextual substitutions

The original text	by professional translators	By Alice AI
I keep track of my time	я слежу за временем	я отслеживаю затраченное время
Indeed, I suspect that the mild physical arousal of the walk may spill over into greater mental alertness.	Вдобавок, по-моему, легкая физическая активность прогулки повышает и активность разума.	Более того, я подозреваю, что умеренное физическое возбуждение от ходьбы может переходить в повышенную умственную активность.

AI, by contrast, tends to preserve the grammatical and syntactic structure of the original, a characteristic feature of machine translation. Moreover, professional translators strive for objectivity at the sentence level—many sentences are rendered as impersonal or indefinitely personal constructions. Alice AI, however, leans toward explicitness and often translates word-for-word (see Table 4).

Conclusion

The AI translation is unadapted, overly literal, and at times relies heavily on calquing, whereas the human translation is more natural and concise. The professional translators successfully adapted the syntax to suit the Russian language, while Alice retained the English syntactic structure. In each case the team of professional translators employed a domestication strategy, whereas Alice AI relied on foreignization—a choice that ultimately shaped how the text was understood and perceived as a whole.

Korney Chukovsky once wrote in *The Art of Translation*: "A translation is considered good if, while reading it, we forget the original and it seems to us that the original was written in our native language." The Bakanov School translation meets Korney Chukovsky's criterion. The AI (Alice) translation is technically competent but stylistically unadapted to the Russian reader and does not meet Chukovsky's criterion.

Comparative analysis of translation transformations

The original text	by professional translators	By Alice AI
I spend a few months each year in Berkeley, and one of my great pleasures there is a daily four-mile walk on a marked path in the hills, with a fine view of San Francisco Bay.	Каждый год я провожу несколько месяцев в Беркли. Одно из величайших удовольствий для меня – ежедневная четырех мильная прогулка по тропе среди холмов, с прекрасным видом на залив Сан-Франциско.	Каждый год я провожу несколько месяцев в Беркли, и одно из моих главных удовольствий там – ежедневная четырёх мильная прогулка по размеченной тропе в холмах с прекрасным видом на залив Сан-Франциско
Even in the absence of time pressure, maintaining a coherent train of thought requires discipline.	Для поддержания связной цепочки рассуждений – даже неспешных – необходима дисциплина.	Даже при отсутствии цейтнота поддержание связного хода мыслей требует дисциплины.
You can confirm this claim by a simple experiment	Это подтверждается простым экспериментом.	Вы можете подтвердить это утверждение с помощью простого эксперимента.

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INTEGRATING ARTIFICIAL INTELLIGENCE IN AUDIOVISUAL TRANSLATION: ENHANCING WORKFLOW IN SUBTITLING

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Abstract. This paper examines the impact of AI on audiovisual translation (AVT) and subtitling workflows. It concludes that while AI accelerates transcription and translation processes, a hybrid model requiring human editing remains indispensable for preserving cultural nuance, emotional depth, and overall subtitle quality.

Keywords: Audiovisual translation; subtitling; Artificial Intelligence; Neural Machine Translation; Automatic Speech Recognition.

ИНТЕГРАЦИЯ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В АУДИОВИЗУАЛЬНЫЙ ПЕРЕВОД: УЛУЧШЕНИЕ РАБОЧЕГО ПРОЦЕССА СУБТИТРИРОВАНИЯ

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Аннотация. В статье рассматривается влияние искусственного интеллекта (ИИ) на аудиовизуальный перевод (АВП) и субтитрирование. Отмечается, что хотя ИИ значительно ускоряет процессы транскрипции и перевода, участие человека остается необходимым для сохранения для сохранения культурных нюансов, выразительности и качества текста.

Ключевые слова: Аудиовизуальный перевод; субтитрирование; искусственный интеллект; нейронный машинный перевод; автоматическое распознавание речи.

Introduction

The emergence of artificial intelligence (AI) has profoundly reshaped the field of audiovisual translation (AVT), particularly in the subtitling. Recent developments in neural machine translation (NMT), automatic speech recognition (ASR), and large language models (LLMs) have transformed professional subtitling workflows [2]. Even though AI tools have increased the efficiency of subtitling, substantial human editing remains necessary to achieve top-tier quality Accordingly, Tardel introduces

a subtitling workflow that strikes an optimal balance between manual intervention and AI-driven tasks [7]. This model integrates technologies such as Automatic Speech Recognition (ASR) and Machine Translation (MT) into the transcription, synchronization, and editing phases, ensuring that AI enhances rather than replaces human expertise. The primary goal is to maximize efficiency by minimizing the time and technical effort required from the subtitler while preserving the high quality of the final subtitles.

Theoretical framework

To turn spoken dialogue into timed, multilingual text, contemporary AI subtitling platforms rely on a step-by-step workflow. Striuk and Hordiienko break this setup down into four main parts: automatic speech recognition (ASR), machine translation (MT), a formatting module for subtitle segmentation, and a user interface for human revision [6]. If audiovisual translators want to navigate this technology effectively, they need a clear grasp of what happens behind the scenes at each stage.

ASR is the first stage in any automated subtitling pipeline: it converts spoken dialogue in a video or audio file into a written transcript, which then feeds into machine translation. Modern ASR systems significantly reduce the manual labor traditionally required for transcription and synchronization. However, research consistently shows that ASR-generated subtitles still fall short of broadcast-quality standards. ASR-generated subtitles are systematically less accurate than human-made ones, and that subtitle errors produced by ASR negatively affect viewer evaluations of both the speaker and the content [3].

Methods and results

Common problems in ASR-generated subtitles include speech recognition errors (especially with accented speech or background noise), oversegmentation (too many short subtitles), undersegmentation (subtitles that are too long, and failure to respect syntactic or semantic units). These findings underscore that substantial human post-editing remains necessary before ASR output can be considered broadcast-ready.

Once transcription is complete, the text must be translated. Neural machine translation (NMT) engines – and increasingly, LLM-based systems such as GPT-4 – now perform this task automatically. Research into NMT's evolution highlights both its progress and its persistent limitations. A study in MIT's *Transactions of the Association for Computational Linguistics* confirms that LLMs significantly improve the translation of long sentences and reduce reliance on parallel training data, but challenges in domain mismatch and rare word prediction remain unresolved [5].

For subtitling specifically, the challenge of machine translation is compounded by the multimodal nature of the task. Video content depends heavily on subtext, tone, and visual cues – elements that generic AI models frequently miss. A character speaking sarcastically may say "Great job", which a literal translation engine

renders as a genuine compliment, completely inverting the scene's meaning. Such context errors can particularly damage viewer's experience.

On the segmentation stage, AI systems must divide translated text into subtitle blocks that comply with reading speed limits, character-per-line restrictions, and synchronization requirements. AI tools address this through automated segmentation algorithms that analyze sentence boundaries, dialogue turns, and reading speed simultaneously.

After that, human translators review, correct, and refine the AI-generated output using different platforms and tools.

The integration of large language models (LLMs) such as GPT-4, GPT-4 Turbo, and Google Gemini into subtitling workflows has introduced new possibilities for contextual adaptation. These transformer-based models hold a distinct advantage in capturing contextual information and accurately processing colloquial speech features for more culturally relevant natural translations.

Beyond general-purpose MT engines, the subtitling industry has developed dedicated AI platforms that integrate ASR, NMT, and subtitle-specific formatting within a single workflow. Tools such as TransVisio [1], Matesub, and Maestra represent a new generation of subtitling software that automates the technical aspects of the subtitling process – spotting, timing, segmentation, and timecoding – while enabling human linguists to focus on meaning and nuance. These platforms illustrate how the professional subtitling landscape is increasingly built around human-AI collaboration rather than either pure automation or purely manual workflows.

A study investigating AI-assisted subtitling on the Viki streaming platform for Chinese television dramas found that while AI technologies enhance translation speed and accessibility, they often struggle with preserving narrative coherence, cultural nuance, and emotional resonance – especially in the absence of human intervention. Human translators were found to play a crucial role in restoring idiomatic meaning, symbolic references, and character identity, thereby improving audience immersion. The study proposes a hybrid model that integrates automated processing with targeted human refinement as the optimal approach for streaming platforms [4].

Conclusion

In conclusion, although artificial intelligence has significantly advanced the speed and accessibility of audiovisual translation, human involvement remains absolutely essential in the subtitling process. While neural machine translation engines offer highly efficient automated processing, they inherently lack the cognitive sensitivity required to interpret fast-paced dialogue, cultural subtleties, and complex subtext. Human translators are crucial for bridging this gap, restoring the narrative coherence, idiomatic accuracy, and emotional resonance that AI alone often misses. Ultimately, achieving high-quality subtitles requires a hybrid approach, where the efficiency of automated systems is firmly guided and refined by human linguistic expertise.

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FEATURES OF TRANSLATING TERMINOLOGICAL VOCABULARY IN THE FIELD OF LOGISTICS (BASED ON THE DHL COMPANY WEBSITE)

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Abstract. The article examines strategies for translating terminological vocabulary in the field of Logistics based on English and Russian versions of the official websites of the DHL company. Based on comparative analysis, the key strategies were identified, and their adequacy in the context of web localization was assessed.

Keywords: logistics terminology; translation strategies; web localization; DHL.

ОСОБЕННОСТИ ПЕРЕВОДА ТЕРМИНОЛОГИЧЕСКОЙ ЛЕКСИКИ В ОБЛАСТИ ЛОГИСТИКИ (ПО МАТЕРИАЛАМ САЙТА КОМПАНИИ DHL)

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Аннотация. В статье рассматриваются стратегии перевода терминологической лексики в области логистики на основе английской и русской версии официальных веб-сайтов компании DHL. На основе сравнительного анализа были определены ключевые стратегии и проведена оценка их адекватности в контексте веб-локализации.

Ключевые слова: терминология логистики; стратегии перевода; веб-локализация; DHL.

Introduction

The purpose of the research is to show and analyze the main methods and features of translation of terminological vocabulary in the logistics sphere.

Theoretical framework

In modern translation and linguistics studies, the concept of “term” is the key point for LSP. As V. M. Leychik notes, terminology has emerged as an independent scientific discipline studying the nature, structure, and functioning of terms. [6, p. 15]. Russian terminology originated in the works of D.S. Lotte, who created the foundations of a scientific approach to the ordering and standardization of technical terminology, developing the principles of selection and construction of terms [7, p. 5].

Translation of terms is one of the most crucial tasks in the work of a translator, especially when working with special texts. As V.N. Komissarov points out, translation activity requires of a specialist to have not only knowledge of language, but also the ability to navigate the conceptual framework of the relevant subject area [5, p. 122]. In translation studies, the main methods of translating terms are identified as follows:

1. Transcription and transliteration are the transmission of the sound or graphic form a word in the source language by means of the target language. For example, logistics - логистика [8, p. 56].

2. Tracing is the translation of the components of a word or phrase, followed by combining the translated components. For example, supply chain – цепь поставок [11, p. 167].

3. Descriptive translation is the disclosure of the meaning of a term using an expanded phrase if there is no corresponding equivalent in the target language [2, p. 99].

4. The selection of an equivalent or analogue is the use of an existing equivalent in the target language that denotes a similar concept.

5. Concretization/generalization is the replacement of a source language word with a broader meaning by a target language word with a narrower meaning, or vice versa.

The choice of a specific method is determined by the type of term, the availability of an established equivalent in the target language, and the communicative purpose of the text. Website translation is considered a complex localization process that goes beyond the simple replacement of linguistic units: it involves adapting the content, structure, and pragmatics of the text to the cultural, technical, and marketing characteristics of the target audience. Localizing a logistics company's website means combining professional accuracy with accessibility for a wide range of users [8, p 98].

Methods and results

Using a continuous sampling method, English-language terms and their Russian-language equivalents were selected from the main page and the "Shipping Services" section (global website), as well as from the Russian-language website express.dhl.ru (sections "Express Delivery," "Campaigns and Special Offers," and FAQ). Look at three illustrative examples:

Example 1. Tracing: Air Freight – Авиаперевозка.

On the global website, the term is used in the context: *"Our air freight services offer time-definite deliveries."* The Russian version reads: *«Авиаперевозки DHL – это надёжность и скорость»*. The two-component term "air freight" is translated using a tracing method with structural contraction: two English words are combined into a single Russian compound word, which complies with Russian word formation norms. This variant is entrenched in professional discourse and ensures unambiguous perception. The same model is used to translate road freight - автоперевозка and ocean freight → морская перевозка. [3, 4].

Example 2. Lexical substitution with concretization: *Shipping Services – Услуги по доставке*.

The English word "shipping" is polysemantic: it can refer to shipping, loading, transportation, or delivery. A literal translation – "услуги по отгрузке" or "судоходные услуги" – would be inappropriate for a corporate website aimed at the end customer. The translator chose the specific meaning "доставка," which best matches the actual range of services offered. This technique – concretization – adapts a broad concept from the source language to a more precise equivalent in the target language, which improves the clarity of the text for Russian-speaking users [9, p.45]. [3, 4]

Example 3. Pragmatic adaptation: *Time-definite delivery - Доставка «из рук в руки»*.

The term "time-definite delivery" denotes delivery within a guaranteed time window. Its literal translation ("доставка в фиксированный срок") is accurate but lacks emotional resonance. On the Russian website, the translator used the idiomatic expression "из рук в руки," which carries connotations of reliability, personal contact, and guarantee. This is an example of pragmatic adaptation: the translator sacrifices literalness to preserve the original's communicative effect—building trust in the client. This strategy is consistent with the concept of dynamic equivalence [11, p.45] and is particularly appropriate for promotional and informational texts on a corporate website. [4]

Table 1

Methods for translating terminology on the DHL website

Term in English language (original)	Translation into the Russian language	Method of translation	Comment
Global Logistics	Глобальная логистика	Tracing	The term – phrase is translated by calquing. Corresponds to the Russian language
Warehouse Solutions	Складские решения	Tracing	Adequate transmission of structure and meaning.
Supply Chain	Цепь поставок	Tracing	A well-established terminological equivalent [1, p.98]
Contract Logistics	Контрактная логистика	Tracing	Direct and accurate translation.
Pallets, Containers, Cargo	Паллеты, контейнеры, грузы	Transcription/transliteration, equivalent	Pallets are transliteration; containers and cargoes are direct equivalents.
Documents, Parcels	Документы, Псылки	Direct equivalent	Direct correspondence
VIP delivery	ВИП-доставка	Transcription + tracing	The abbreviation VIP is retained as a borrowing and supplemented with the Russian word "delivery".

Conclusion

The analysis of translation solutions on the DHL website allows us to formulate the following conclusions. Firstly, the dominant method of translating logistic terminology is calquing, often accompanied by structural contraction. This is due to

the presence of well-established correspondences in the Russian-language professional discourse and the need to preserve the corporate terminological identity. Also, lexical substitution with concretization is used when translating broad-valued English terms and allows for greater clarity for the target audience. Pragmatic adaptation (idiomatic substitution) is used in cases where a literal translation does not provide the desired communicative effect of attracting and convincing the client.

To summarize, the translation solutions on the DHL website are generally adequate: they ensure accurate transmission of professional information and correspond to the pragmatics of web localization – creating the user's impression of a product originally created in Russian.

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THE BENEFITS AND DOWNSIDES OF AI TRANSLATION IMPLEMENTATION INTO AUDIOVISUAL TRANSLATION

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Abstract. The article examines the specific features and outcomes of using AI in the process of audiovisual translation of foreign video material into Russian language, as well as the potential downsides and advantages that this may entail.

Keywords: audiovisual translation; translation studies; artificial intelligence (AI); artificial intelligence (AI) implementation in translation.

ПОЛОЖИТЕЛЬНЫЕ И ОТРИЦАТЕЛЬНЫЕ СТОРОНЫ ПРИМЕНЕНИЯ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В АУДИОВИЗУАЛЬНОМ ПЕРЕВОДЕ

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Аннотация. Статья посвящена изучению специфики и итогов применения ИИ в процессе аудиовизуального перевода иностранных видеоматериалов на русский язык и потенциальных недочетов и преимуществ перевода, которые оно может вызывать.

Ключевые слова: аудиовизуальный перевод; переводоведение; искусственный интеллект (ИИ); применение искусственного интеллекта (ИИ) в переводе.

Introduction

In the contemporary world, digitalization and globalization serve as the primary drivers of cross-linguistic interaction. Consequently, translation, both as a process and a result, is an indispensable component of communication between diverse linguistic societies and cultures [4]. Translation is an intellectual labor that requires not only extensive linguistic knowledge but also creativity, technological mastery, and a capacity for psychological and social adaptation [5]. According to A.A. Soler, translation is divided into two stages: understanding the source text in the original language and rendering that text in the target language [11, p. 135]. The relevance of

this study is underscored by the rapid evolution of Artificial Intelligence, which has transitioned from a theoretical concept into an active professional tool.

Audiovisual translation (AVT), often categorized as "cinema translation," encompasses specific modes such as dubbing, subtitling, and voice-over. The texts of audiovisual works are often literary in nature and differ in terms of their purpose, the nature of the information conveyed, and the methods used to convey it [10, p. 351]. In the Russian context, voice-over remains highly prevalent, involving the overlay of a translated text while preserving the original acoustic background. This requires strict adherence to technical parameters, including time-coding and the principles of "pseudo-oral" speech [2]. As AI technologies begin to permeate this sphere, it is essential to analyze whether machines can replicate the "language feeling" necessary for high-quality AVT [1].

Theoretical framework

Current AI translation systems are primarily based on Neural Machine Translation (NMT), which utilizes artificial neural networks to simulate human brain activity. The use of such systems "enables the machine to translate entire sentences, taking into account the immediate surroundings and context" [7, p. 45]. Unlike older systems, NMT processes entire sentences within their context, leading to more fluid outputs. However, natural language is a "second human signaling system," functioning on the basis of biological reflexes and sensory input. While AI can select a response by analyzing millions of variants, it lacks the intuitive capacity to match ideas and cultural meanings rather than just lexemes [9].

Translation is a multifaceted process involving logic, psychology, and stylistics [3]. A fundamental challenge remains: no dictionary (or, in our case, AI system) can currently foresee all possibilities for using phraseological units or metaphors in a specific context [6]. As a result, machine outputs often lack the expressive and stylistic features that characterize a professional human translation.

Advantages of AI implementation in AVT

The integration of AI into the AVT workflow offers several quantifiable benefits [8]:

1. Automation of Routine Tasks: AI excels at translating standard documentation, correspondence, and repetitive scripts, which allows human translators to focus on more complex and creative aspects of a project;
2. Increased Productivity: Systems like Google Translate and Microsoft Translator provide high-speed processing, facilitating the rapid turnaround of materials in a globalized market [9];
3. Terminology Consistency: For specialized pop-science content, AI models like DeepL demonstrate a high degree of precision in maintaining technical terminology, which is often a source of error in manual translation [8];

4. Style Adaptation: Generative models, specifically ChatGPT, offer flexibility in adjusting the style and tone of a translation through specific prompting, aiding in the creation of localized versions for different target markets.

Technical and semantic limitations

Despite these benefits, the application of AI in AVT reveals significant deficiencies, particularly regarding "implicit information" — the meanings and emotions hidden between the lines:

1. Synchronization Failures: AVT requires phonetic, dramatic, and semantic synchronization. AI often fails to produce text that fits within the rigid time-codes of the original footage, leading to a mismatch between visual action and audio delivery [8];

2. Loss of Cultural Nuance: Boyarkina A.V. indicates that AI struggles with metaphors, sarcasm, and local slang [1]. It often produces a "flat" translation that fails to preserve the atmospheric or aesthetic function of the original message;

3. Lack of Psychological Adaptation: AI remains an information carrier without the capacity for social or psychological intuition. In literary or cinematic contexts, it cannot yet replicate the "soul" of a language or the specific authorial voice [1].

Methods and results

To provide a concrete comparison, this study examines the popular science series *How the Universe Works* (Discovery Channel). The official Russian translation was executed by "SDI Media Russia". The series is characterized by its dramatic tone and high density of astronomical terminology.

The professional translation by SDI Media Russia utilizes "generalization" and "compensation" to ensure the Russian text remains expressive while fitting strict time constraints. In contrast, AI-generated versions often produce "calques" – direct word-for-word translations that sound unnatural in Russian and exceed the original speaking time.

The table below presents a broadened comparison of specific fragments from the series to highlight the qualitative gap between human-led studio work and AI output (see Table 1).

The studio translation by SDI Media Russia displays a superior grasp of register and metaphor. For instance, translating "violent death" as "мучительная гибель" (painful/agonizing death) conveys the dramatic scientific tone better than the AI's literal «насильственная смерть» (violent/criminal death). Furthermore, the studio's use of «колеблется» (oscillates/vibrates) for space-time is scientifically accurate, whereas the AI's «рябит» (ripples/glitches) is stylistically informal. Additionally, examples like «окончательные охотники» or «Гравитация – это клей» and «Сверхновая» show significant lack of knowledge from the AI's part.

Translation versions comparison

Original English Version	Studio Translation (SDI Media Russia)	AI Translation Version
<i>The fabric of space-time ripples under the influence of massive bodies.</i>	<i>Ткань пространства-времени колеблется под влиянием массивных тел.</i>	<i>Ткань пространства-времени рябит под влиянием массивных тел</i>
<i>The sun is a ticking time bomb, and one day, it will consume the Earth.</i>	<i>Солнце – бомба замедленного действия, которая однажды поглотит Землю.</i>	<i>Солнце – это тикающая бомба с часовым механизмом, и в один день оно поглотит Землю.</i>
<i>Stars are the engines of the cosmos, burning with a fierce intensity.</i>	<i>Звезды – это двигатели космоса, пылающие с неустойчивой силой.</i>	<i>Звезды – это двигатели космоса, горящие с яростной интенсивностью.</i>
<i>A supernova is the violent death of a massive star.</i>	<i>Супернова – это мучительная гибель гигантской звезды.</i>	<i>Сверхновая – это насильственная смерть массивной звезды.</i>
<i>Gravity is the glue that holds the universe together.</i>	<i>Гравитация – это связующее звено всей Вселенной.</i>	<i>Гравитация – это клей, который удерживает вселенную вместе.</i>
<i>And so, the universe began with a bang.</i>	<i>Так, Вселенная началась со взрыва.</i>	<i>И таким образом, Вселенная началась с большого взрыва.</i>
<i>A black hole is a point of no return.</i>	<i>Черная дыра – это точка невозврата.</i>	<i>Черная дыра – это точка, из которой нет возврата.</i>
<i>This cosmic furnace forged the elements of life.</i>	<i>В этом космическом горниле выкованы элементы жизни.</i>	<i>Эта космическая печь выковала элементы жизни.</i>
<i>The galaxy is being torn apart by dark energy.</i>	<i>Темная энергия разрывает галактику на части.</i>	<i>Галактика разрывается на части темной энергией.</i>
<i>Black holes are the ultimate hunters of the deep cosmos.</i>	<i>Черные дыры – совершенные хищники глубокого космоса.</i>	<i>Черные дыры – окончательные охотники глубокого космоса.</i>

Conclusion

The integration of Artificial Intelligence into audiovisual translation represents a significant technological leap that provides undeniable benefits in speed and data management, helping to delegate “easy tasks” to the AI. However, at the current stage, AI serves as an “effective assistant” rather than a full replacement for the human translator. The necessity for human post-editing, or in other words correction of failures in synchronization, cultural context restoration, and stylistic consistency

conviction remain absolute. As demonstrated by the work of SDI Media Russia, high-quality audiovisual products require a level of dramatic and technical synchronization that AI currently cannot achieve without extensive human oversight. Consequently, it can be asserted with confidence that, in the contemporary landscape, artificial intelligence does not constitute a threat, but rather a significant opportunity.

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COMPARATIVE ANALYSIS OF RUSSIAN PAROEMIAS TRANSLATION BY GENERATIVE MODELS YANDEXGPT, CHATGPT, DEEPL AND GOOGLE GEMINI

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Abstract. The paper examines the problem of translating Russian paroemias by generative models: YandexGPT, ChatGPT, DeepL and Google Gemini. The aim is to identify its dependence on neural network architecture and paroemia type. YandexGPT showed the best result. DeepL is effective with full equivalents. ChatGPT and Gemini translate literally.

Keywords: neural machine translation; Russian paroemias; cultural specifics.

СРАВНИТЕЛЬНЫЙ АНАЛИЗ ПЕРЕВОДА РУССКИХ ПАРЕМИЙ ГЕНЕРАТИВНЫМИ МОДЕЛЯМИ YANDEXGPT, CHATGPT, DEEPL И GOOGLE GEMINI

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Аннотация. В статье исследуется перевод русских паремий моделями: YandexGPT, ChatGPT, DeepL и Google Gemini. Цель: выявить зависимость перевода от архитектуры нейросети и типа паремий. YandexGPT показал лучший результат. ChatGPT и Gemini склонны к дословному переводу. DeepL эффективен при наличии полных аналогов.

Ключевые слова: нейросетевой перевод; русские паремии; культурная специфика.

Introduction

Paroemias, i.e., proverbs and sayings, are more than just linguistic units. They convey cultural values, historical experience, and national identity. Translating them reveals how well a neural network understands the cultural context.

Neural machine translation architectures such as YandexGPT, ChatGPT, DeepL, and Google Gemini are now widely used for various translation tasks. However, their performance is typically tested on technical or non-fiction texts.

The findings will offer practical guidance for selecting machine translation tools for culturally sensitive content and contribute to a deeper understanding of how neural architectures approach cultural adaptation in translation.

Theoretical framework

This study analyzes the four generative models: YandexGPT, ChatGPT, Google Gemini, and DeepL. They represent different approaches to neural machine translation.

The architecture of YandexGPT is specially optimized for the Russian language. It was trained on a large corpus of Russian texts. ChatGPT and Google Gemini are general-purpose large language models. They support multiple languages. However, their training focuses primarily on English texts. DeepL Translator relies on neural networks trained on large volumes of existing translations. The service employs exclusive architecture focused specifically on translation tasks.

It is necessary to present a theoretically grounded typology of paroemias for the correct assessment of their translation quality. Such a typology must account for the specific difficulties that arise when rendering culturally marked elements.

The classification of paroemias in this study is based on the traditional division by equivalence types common in translation studies. According to M.N. Sergunina, comparative studies of paroemias traditionally distinguish the following types of cross-language equivalence: complete equivalents, partial equivalents, and non-equivalents [2]. Complete equivalents are paroemias that coincide in two languages in terms of meaning, figurative basis, and stylistic coloring. Partial equivalents coincide in meaning but differ in their figurative component. This requires replacing the original image with a culturally acceptable one in the target language. Non-equivalents have no correspondence in the paremiological corpus of target language.

However, a comprehensive assessment of translation quality produced by neural network architectures requires expanding this classification. Additional categories of paroemias must be included. These categories present particular difficulty for machine translation due to their linguistic and cultural specificity.

Paroemias containing obsolete vocabulary constitute a special group that requires separate consideration [3]. As A.S. Shestakova and D.A. Fisher noted in their study of obsolete vocabulary, proverbs and sayings are “a kind of linguistic monument that preserves the features of the ancient language” [4, p. 1]. Archaisms are words that have been displaced from active use by synonyms. Isolating this group as an independent category allows for an assessment of the ability of generative models to recognize obsolete elements. It also tests their capacity to correctly interpret these elements within the context of the paroemia.

Wordplay, or the pun, represents one of the most complex objects for translation. It requires preserving not only the meaning but also the stylistic effect based on linguistic play. According to S.S. Ivanov in his study on wordplay and the ways of its

creation, wordplay always implies the “possibility of different interpretations of the units involved in the play” and “serves to create a situation of ambiguity” [1, p. 227]. When translating paroemias containing wordplay, the neural network faces the task of finding some correspondence in the target language. Isolating this group allows for an evaluation of the extent to which generative models render stylistic devices, and not just the subject’s logical content.

Methods and results

To assess the translation quality of Russian paroemias, a dataset of 100 paroemias was compiled, with 20 examples in each of five typological groups. The selection included both widely used proverbs and culturally specific expressions.

The five groups are characterized as follows. The first comprises complete equivalents, e.g., *Better late than never* (*Лучше поздно, чем никогда*) and *Time is money* (*Время – деньги*). These expressions have direct analogues in English, so a correct translation simply reproduces the existing equivalent.

Partial equivalents form the second group, e.g., *When pigs fly* (*Когда рак на горе свиснет*) and *To make a mountain out of a molehill* (*Делать из мухи слона*). Here, the meaning must be preserved by replacing the original imagery with culturally appropriate metaphors. A poor translation would be a literal calque, such as “when the crayfish whistles on the mountain” or “to make an elephant out of a fly”, which would be meaningless to an English speaker.

The third group is non-equivalents, e.g., *Авось, небось да как-нибудь* and *За битого двух небитых дают*. Successful handling requires either descriptive rendering, e.g., relying on sheer luck, or a functional equivalent, e.g., that experience is the best teacher. Literal calques like “avos, nebos and somehow” or “they give two unbeaten for one beaten” fail to convey the intended meaning.

The fourth group includes archaic expressions, e.g., *Береги платье снову, а честь смолоду* and *Голод не тетка, пирожка не подсунет*. These contain outdated vocabulary (e.g., *снову* meaning “when new”). A good translation must first recognize the archaic elements and then render meaning clearly.

The fifth features wordplay, e.g., *Не имей сто рублей, а имей сто друзей* and *На безрыбье и рак рыба*. An effective translation should preserve both the meaning and the stylistic device where possible. Prioritizing literal accuracy at the expense of the playful effect results in a flat and uninspired rendering.

The translation quality of Russian paroemias was evaluated on a five-point scale (see Table 1). Each score corresponds to a specific degree of accuracy in conveying meaning, imagery, and idiomaticity.

The application of these criteria made it possible to obtain experimental data on the quality of translations across four neural network architectures. The results show the effectiveness of each neural network by paroemia type (see Table 2).

Table 1

Grading scale

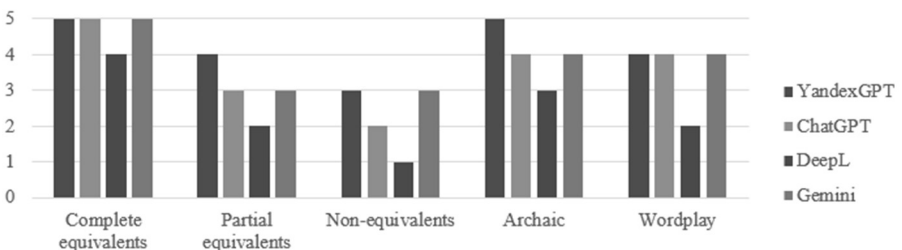
Grade	Meaning	Criteria
1	Very poor	The output bears no semantic relation to the source text.
2	Poor	The translation is a literal calque, missing the meaning of the paroemia.
3	Satisfactory	The translation fails to preserve the figurative or cultural essence of the original although it is grammatically correct.
4	Good	The core meaning is accurate, but the translation exhibits slight stylistic awkwardness.
5	Excellent	The translation reads naturally in the target language.

Table 2

Evaluation of Russian paroemias translation quality by neural networks

Paroemia Group	YandexGPT	ChatGPT	DeepL	Gemini
Complete equivalents	5	5	4	5
Partial equivalents	4	3	2	3
Non-equivalents	3	2	1	3
Archaic	5	4	3	4
Wordplay	4	4	2	4

To provide a clearer representation of the results, a histogram was used as a visualization method (see Fig.). The graphical display of the scores allows for a quicker assessment of the overall effectiveness of the architectures and reveals gaps in translation quality between different groups of paroemias.



Pic. 1. Histogram of translation quality scores by network and paroemia group

The histogram shows that YandexGPT receives high scores more often than other architectures, while DeepL systematically demonstrates the worst result. However, simply summing up the scores is insufficient for the final ranking of neural networks, since the groups have different degrees of complexity and, therefore, should contribute unequally to the final translation assessment.

The most relevant approach for obtaining an integral assessment and rank neural networks by overall effectiveness is the analytic hierarchy process. This method helps to account for the varying importance of different paroemia groups.

The highest weight was given to the most challenging categories. Non-equivalents received 0.35, requiring cultural interpretation rather than simple word matching. Partial equivalents got 0.25 because finding an analogue with a different image is still a complex task. Archaic idioms were assigned 0.2, as they require recognition of outdated elements. Wordplay received 0.15, as it demands preserving both meaning and pun. Complete equivalents were given just 0.05 because they represent fixed clichés.

The results provide clear ranking. YandexGPT took the top spot with a score of 3.9, which confirms its strength in handling culturally specific material. Google Gemini and ChatGPT demonstrated similar results. The former scored 3.45, while the latter scored 3.1. This similarity is likely due to comparable architectural solutions and similar volumes of training data. DeepL lagged far behind with only 1.95, mainly due to poor performance on non-equivalents and partial equivalents, where it often produced meaningless calques.

Conclusion

The findings confirm that a neural network's ability to convey cultural context directly affects translation quality. The study revealed that models designed for context-aware generation handle figurative language and cultural specificity better than those built primarily for direct sequential translation.

YandexGPT demonstrated the highest effectiveness with culturally marked units. This makes it a preferable tool for translating Russian texts rich in national and cultural specificity.

The results suggest that evaluating machine translation quality should not be limited to grammatical correctness. A meaningful comparison of systems requires a multifactorial analysis that considers how well a model handles different types of linguistic units, including those that demand interpretation beyond literal meaning.

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TRANSLATION PROBLEMS IN COMPUTER GAMES

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Abstract. The article studies how translators deal with culturally specific vocabulary and slang in computer games by utilising various strategies and methods to make the text comprehensible to people speaking the target language. The study analyzes examples from an English-to-Russian localised game to identify the most frequently used translation techniques.

Keywords: computer games; localization; slang; culture-specific vocabulary; cultural adaptation.

ПРОБЛЕМЫ ПЕРЕВОДА КОМПЬЮТЕРНЫХ ИГР

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Аннотация. В этой статье рассматривается, как переводчики работают с культурно-маркированной лексикой и сленгом в компьютерных играх, используя различные стратегии и методы, чтобы сделать текст понятным для людей, говорящих на языке перевода.

Keywords: компьютерные игры; локализация; культурно-маркированная лексика; сленг; приемы перевода.

Introduction

Video game localisation is aimed at adapting a computer game for an audience from a different linguistic/cultural background. The process doesn't involve only the language translation but also cultural and technical adjustments, the aim is to ensure that players speaking the target language get roughly the same experience as players of the original version [2; 3].

Theoretical framework

One of the main challenges of localisation is the translation of culture-specific vocabulary. These words often lack direct equivalents in the target language and are closely tied to the original culture. The way they are localised often depends on the translation strategy being used by the professional: foreignization aims to preserve cultural elements through transcription or calquing, while domestication adapts them using descriptive or analogous translation. Another important aspect is the translation of slang, which is characterized by informality and high expressiveness. Due to cultural and stylistic differences between English and Russian, slang is rarely translated in its literal meaning. In most cases, translators rely on transformation strategies, such as functional equivalents, modulation, generalization, or compensation, in order to preserve stylistic effect and ensure naturalness in the target language.

Methods and results

We analyzed a total of 20 examples of culture-specific vocabulary and slang in video game localisation. The results indicate that most of the time, translators end up changing significantly adapt the content to keep the game feeling authentic while still making sense to players speaking the target language.

Table 1

Strategy of foreignization, usage of the calquing method

Original	Translation
Santa will bring me toys!	Санта принесет мне игрушки!

This case shows us how by preserving the American realia “Santa” and not replacing it with the culturally adapted “Дед Мороз” [1], the translator managed to keep the setting of a national American holiday and retain the authenticity of the original narrative context.

In this example, the slang "chill" was localised by using a functional equivalent within a transformational strategy. Both the original and translation are a "temperature-based" metaphor, therefore allowing the translator to preserve the meaning and informal tone of the expression.

Table 2

Transformational strategy, usage of a functional equivalent

Original	Translation
Chill, Sean	Остынь, Шон.

Table 3

Domestication strategy, usage of the adaptation method

Original	Translation
You're like those protesters from Occupy.	Вы как активисты с митингов.

In this case, the translator replaced the reference to the Occupy Wall Street movement with a more general expression that would be easier for the target audience to understand. This approach allows the meaning of the utterance to remain clear without relying on background cultural knowledge.

Table 4

Domestication strategy, usage of analogous translation

Original	Translation
Trick or treat!	Сладость или гадость!

In this example, the translator decided to use analogous translation rather than copy it word-for-word to convey the cultural meaning of the phrase rather than its literal translation (“Уловка или угощение”) The original expression is tied to Halloween, a national holiday in the United States. Its established Russian equivalent allows the translator to keep the same meaning and impact while making it understandable for the target audience. This solution maintains the cultural reference and makes it sound natural to Russian speakers.

Table 5

Transformational strategy, usage of the functional equivalent

Original	Translation
You're hella weird.	Ты реально странный.

Here the translator utilized a functional equivalent “реально” Since this is an item of American slang that originated in California and has no direct equivalent in Russian, it was replaced with an intensifier “реально” which allows the translated

utterance to be on the same level of expressiveness. Though this does result in the loss of regional colouring, the emotional tone and informal style of the original utterance are preserved.

Conclusion

Our analysis of the cultural realia of 20 different examples, 10 examples from culturally marked vocabulary has shown that the strategies most often used by translators were: use of analogous translation (8), which preserved the cultural background, along with calquing (6) and transcription (6), helping target-language speakers navigate the text.

The analysis of the remaining 10 slang examples proved to be the most challenging due to its close connection to the source culture. Analogous translation makes up 7 of the examples, modulation is featured in 2, and transliteration only in 1, all of these methods were used to create a more natural-sounding conversation.

Overall, translators most frequently used analogous translation to convey aspects of American youth culture and achieve the intended stylistic effect.

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**COMPARATIVE ANALYSIS:
MACHINE VS. HUMAN TRANSLATION QUALITY
OF PSYCHOLOGICAL TERMS IN POPULAR SCIENCE TEXT**

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Abstract. This article analyzes the quality of machine translation of psychological terms in popular science texts. A comparative analysis of machine and human translation is provided. Machine translation of terms cannot be considered adequate without subsequent manual refinement by a human at the post-editing stage.

Keywords: machine translation (MT); artificial intelligence (AI); manual translation/human translation; post-editing; LLM-based translation.

**СРАВНИТЕЛЬНЫЙ АНАЛИЗ КАЧЕСТВА МАШИННОГО
И РУЧНОГО ПЕРЕВОДА ТЕРМИНОВ ПСИХОЛОГИЧЕСКОГО
ДИСКУРСА В НАУЧНО-ПОПУЛЯРНОМ ТЕКСТЕ**

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Аннотация. В статье анализируется качество машинного перевода психологических терминов научно-популярных текстов. Проводится сопоставительный анализ машинного и ручного перевода. Машинный перевод терминов нельзя считать адекватным без последующей доработки человеком на этапе постредактирования.

Ключевые слова: машинный перевод (МП); искусственный интеллект (ИИ); ручной перевод; постредактирование; LLM-перевод.

Introduction

In modern society, there has been a steady increase in interest in understanding the inner world and psychological mechanisms of human beings. Consequently, a specific literary genre has emerged: popular science literature. Coupled with the active use of neural networks in translation, there is a need to assess the quality of machine and LLM translations of popular science texts.

Machine translation is used to speed up and simplify the translation process. However, the quality of machine translation for popular science texts remains low, as such texts have certain stylistic features that must be taken into account when translating terminology. The relevance of this study lies in the unresolved issue of the quality of machine translation of psychological terms in popular science texts.

Theoretical framework

Extralinguistic factors in popular science literature include the communicative context, cultural characteristics, the author's personality and intent, as well as the reader's expectations. Distinctive features include expressiveness, figurative language, and simplicity of presentation [3, p. 169].

In popular science literature, the narrative is based on experts' interactions with patients. As a result, the boundaries blur, and the reader feels as though they are experiencing the events described in the books firsthand. At this point, machine translation systems are unable to achieve this level of accuracy without human intervention during the post-editing stage, since AI generates responses based on probability rather than independent analysis.

Let's take a look at how an LLM works. A sequence of words is fed into the system, providing context for the neural network. The AI processes this sequence by breaking it down into tokens. A probability distribution is constructed based on the set of tokens, from which the next token for the output sequence is then selected. This process is repeated until the response is sufficiently comprehensive, with the result depending on both the neural network architecture and the specific query.

Methods and results

A literature review was conducted on the research topic, and a comparative method was used to identify the advantages and disadvantages of machine translation and human translation.

The study examined 50 general and highly specialized psychological terms from Bessel van der Kolk's book "The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma" [4].

Let's compare the quality of machine translation generated by the AI-powered online translator DeepL, the LLM Perplexity, and the human translation by Ivan Chornyj [3].

The greatest challenge for a human translator lies in adapting terminology to the target audience. Artificial intelligence, on the other hand, specializes in rephrasing text, which allows it to quickly and effectively adapt terminology to the target audience based on their level of expertise. LLM Perplexity and Ivan Chornyj translated the

following phrases identically: “*bipolar disorder*” (биполярное расстройство), “*oppositional defiant disorder (ODD)*” (вызывающее оппозиционное расстройство (ВОР)), “*substance use disorder*” (расстройство на фоне приема психоактивных веществ) [2]. In addition, both the neural network and the human translator provide a translation note.

A previous study found that non-equivalent vocabulary poses the greatest challenge in manual translation. The translation of the term “*agency*” was examined. Ivan Chornyj believes that the term “*agency*” cannot be rendered with a concise equivalent when translating into Russian. The translator uses the technique of modulation and, through logical transformations, derives a new translation variant not found in dictionaries – «*принадлежность*» – and provides a translator’s note [2].

The operation of a neural network is based on the principle of probability, which means that it does not propose a translation it has invented on its own, but rather the most frequent translation option (*агентность, субъектность, чувство автономии*). In other words, if the AI database lacks a translation for a particular term – as is the case with non-equivalent vocabulary – it is unable to come up with its own. At this stage of development, AI does not generate its own ideas.

Another common mistake is disrupting the logical flow in three-component phrases. “*Even though Sandy had learned to ignore her relationship problems and block out her **physical distress signals**, they manifested themselves in symptoms that demanded her attention*” [4, p. 120].

Based on the meaning of the term “*distress*” and given the need to combine it with the translation of the second component of the term “*physical signals*”, the translator opts for a calqued translation based on lexical equivalence – «*физические сигналы бедствия*» [1, p. 358]. The ambiguity of the term “*distress*” is resolved by the lexical context (word combinations). DeepL and Perplexity suggest a different translation option – «*сигналы физического дискомфорта*».

The term “*distress*” refers to a critical psychological state, while the phrase “*physical signals*” denotes its external manifestation. While Ivan Chornyj conveys this meaning, Perplexity distorts the author’s original intent. He applies the adjective “*physical*” to the term “*distress*”, disrupting the semantic relationships within the three-component phrase (adjective + noun + noun).

The term “сигнал бедствия” is used in the context of extreme situations and disasters, when people in distress need to send a signal so that those around them can provide assistance. We have found no other instances of this term being used in Russian psychological discourse. We propose the translation «реакция организма на стресс».

In some cases, machine translators and LLMs fail to detect meaning conveyed implicitly, for example, through the use of quotation marks.

«She'd consulted many mental health professionals before me and had been questioned repeatedly about her "suicidal behavior"» [4, p. 109].

When it comes to terms, quotation marks are used in only two cases. First, if the term is little-known. Examples include the author's own terminology ("*to pendulate*", "*pendulation*") or entirely new, rarely used terms not yet established in dictionaries ("*agency*"). Second, if words are used in an unusual, ironic sense that the author wishes to highlight.

To determine the author's intention regarding the use of quotation marks, it is sufficient to consult a dictionary. One must pay attention to the context if the term is not the author's own, is widely known in the global scientific community, and is established in dictionary entries. In this case, the quotation marks serve as an implicit indication that the original author disagrees with the psychotherapist's wording and treats it with sarcasm.

Ivan Chornyj uses modulation to convey the author's ironic attitude toward the psychotherapist's unethical phrasing, which in the original is rendered using quotation marks (*«суицидальные наклонности»*) [2]. An online translator provides a literal translation (*«суицидальное поведение»*). As a result, the negative connotation is lost.

The term "*suicidal behavior*" refers to actions aimed at taking one's own life. The author places this term in quotation marks to convey an ironic attitude toward the phrasing chosen by the psychiatrist. In the author's view, it would be more appropriate to use "*self-harmful behavior*" (cases of self-harm). The psychotherapist demonstrates incompetence by equating instances of self-harm with suicide attempts. The use of the emotionally charged term *«наклонности»* (tendencies) instead of the neutral *«поведение»* (behavior) better conveys the original author's ironic attitude toward the psychotherapist's phrasing.

It is often very difficult for a machine to identify an unusual meaning of a word, as this requires a highly developed linguistic intuition, which machines lack. Consequently, only humans are often capable of conveying hidden meanings.

Conclusion

Artificial intelligence quickly rephrases text and effectively adapts terminology for the recipient. However, it makes mistakes when translating non-equivalent terminology whose meaning must be inferred from context. Difficulties are observed in conveying implicit meaning, as well as non-compliance with rules of grammar and word usage.

At this stage of neural network development, online translation tools do not always adapt terms to match the recipient's request; human review is required during the post-editing phase, along with a thorough dictionary check.

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AI IN THE PRAGMATIC ADAPTATION OF TRANSLATION IN EXCURSION DISCOURSE

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Abstract. This article examines the pragmatic aspect of translating culturally marked vocabulary in the excursion discourse of the Republic of Belarus, taking into account the national and cultural characteristics of the target audience and the potential of artificial intelligence in addressing this challenge.

Keywords: excursion discourse; translation; culturally marked vocabulary; pragmatic aspect, artificial intelligence.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ В ПРАГМАТИЧЕСКОЙ АДАПТАЦИИ ПЕРЕВОДА В ЭКСКУРСИОННОМ ДИСКУРСЕ

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Аннотация. В статье рассматривается прагматический аспект перевода культурно-маркированной лексики в экскурсионном дискурсе Республики Беларусь с учетом национально-культурных особенностей получателей перевода и возможностей искусственного интеллекта в решении данной задачи.

Ключевые слова: экскурсионный дискурс; перевод; культурно-маркированная лексика; прагматический аспект, искусственный интеллект.

Introduction

Translation in excursion or tour-guiding discourse is not merely a mechanical transcription of text, but a complex act of intercultural mediation that requires consideration of the discourse's specific features, the cultural context and the pragmatics of communication [2]. Consequently, modern translation theory has shifted its focus from the search for formal equivalents to an understanding of translation as an act of intercultural communication. Today, the translator is seen as a mediator whose task is to overcome not only linguistic but also cultural barriers. An adequate translation is impossible without a deep understanding of the cultural code of the source text and without the pragmatic adaptation of this code to a different cultural environment.

Theoretical framework

The pragmatic aspect of translation is directly linked to the concept of the sociocultural concept, which, according to S.G. Vorkachev's definition, constitutes a multidimensional mental construct comprising not only a conceptual basis but also value-based, figurative and behavioral components. The translation of concepts cannot be reduced to the simple selection of a synonym: it is a complex process of interpretation requiring the identification of the core of the concept and its peripheral meanings. The translator must determine which aspect is most relevant in a specific context, or use a descriptive translation to compensate for inevitable losses [3].

In the Republic of Belarus, the main consumers of national guided tour services in English are foreign tourists (from countries outside the CIS) from Europe (Lithuania, Latvia, Estonia, Germany), Turkey and China, which requires significant revision of existing translated tour materials in terms of cultural adaptation.

The pragmatic tasks of translation in tour guide discourse can also be addressed by means of Geert Hofstede's concept of cultural dimensions.

According to Hofstede, Chinese culture is characterised by a high power distance, pronounced collectivism, a long-term orientation and a high degree of modesty. It is a society with a strong hierarchy, where harmony, loyalty to the group (family, company) and reputation are important, and decisions are made with the future in mind [1]. Moreover, from a pragmatic point of view, the absence of religious concepts in the Chinese mindset creates difficulties in translating and explaining a large number of local cultural and historical phenomena and structures associated with religion. For example, when translating the names of churches, it is advisable to use the compressed form *Orthodox Cathedral* rather than the literal translation *Orthodox Cathedral of the Holy Spirit*. At the same time, the Chinese audience is characterised by a good understanding of the realities associated with the history of the Soviet Union and communist ideology, which makes it possible to use transliteration and direct translation: 'Industrialization', 'Stalinist Empire style', etc.

According to Geert Hofstede, Turkish culture is characterised by a high level of uncertainty avoidance, a significant power distance, a combination of collectivist and individualistic tendencies, as well as a pronounced focus on short-term norms and respect for traditions [1]. Translation for a Turkish audience requires understanding of the duality of the Turkish mindset: a combination of Eastern hospitality and emotionality with the pragmatism of modern Western society. A successful strategy is built on creating an emotional and evaluative context around the subject matter, as well as drawing careful yet precise cultural parallels (particularly through common concepts, such as hospitality, family and respect for tradition).

Methods and results

Therefore, the variant of translation of the historical term *fiefdom* suggested in the reference texts for tours published by the National Agency for Sport and Tourism of the Republic of Belarus is an appropriate solution for representatives of European culture, with whom the Republic of Belarus shares a common history of feudalism and an identical linguistic and cultural concept. However, feudalism in Turkey and China had its own distinctive features and did not take the same form as European feudalism. Consequently, the use of the term *fiefdom* will lead to misunderstanding and questions for the guide, for which it is better to be prepared in advance, having a ready explanation or translation of the term for this audience.

It is possible to use artificial intelligence (AI) to adapt a translated text in situations where it is necessary to identify cultural, social or historical equivalents, given the need to process large volumes of information quickly.

So, Deepseek suggests the following adaptations of the original sentence:

*It used to be the center of a **fiefdom**, and then the capital of a voivodship (province) within the Belarusian-Lithuanian State.*

Adaptation option 1: *It used to be the center of a **lord's domain**, and then the capital of a voivodship (province) within the Belarusian-Lithuanian State.*

Adaptation option 2: *It used to be the center of a **hereditary lord's estate**, and then the capital of a voivodship (province) within the Belarusian-Lithuanian State.*

The terms *domain* and *estate* suggested by the AI convey the general meaning of the concept of land ownership; however, the use of the word ‘lord’ is superfluous. The AI’s cultural observations, which justify the adaptation, are particularly valuable:

– ‘The landholdings of a noble’ is a universal concept understood by both the Chinese (贵族领地) and the Turks (soylu mülkü).

– In Chinese culture, hereditary succession (世袭领地) is important, whereas in Turkish culture, the local ruler (bey) is a key concept.

However, the options suggested by the AI lack an important semantic element: chronological order. Feudal ownership, which existed prior to the establishment of the Grand Duchy of Lithuania (1235), belongs to the medieval period; this must be specified in the definition to maintain the narrative’s chronological coherence.

Adaptation option 3 (taking into account the AI’s recommendations): *It used to be the center of a **medieval domain**, and then the capital of a voivodship (province) within the Belarusian-Lithuanian State.*

An interesting challenge in translation is the adaptation of religious terminology. For instance, in the reference texts for guided tours, when referring to the icon of the Mother of God of Minsk the term *Our Lady of Minsk* is used; this does not comply with the principle of translation adequacy, as a specifically Christian name will not be understood by people of other faiths or beliefs.

When adapting the sentence containing this lexical item, Deepseek suggested the following options:

*The most venerated icon is that of **Our Lady of Minsk**.*

Adaptation option 1: *The most famous holy image here is called “**Our Lady of Minsk**.”*

Adaptation option 2: *The most sacred and famous religious image here is the “**Our Lady of Minsk**”.*

Cultural observations from the AI: *icon* is a specific term in Orthodox Christianity. There is no direct everyday equivalent in Turkish or Chinese. A Chinese tourist is more likely to understand *religious painting* or *holy image*.

Thus, the name of the icon has been retained in the AI adaptation. At the same time, an explanatory translation has been used for the term *icon*. This approach is acceptable for the adaptation aimed at Chinese tourists, whereas for Turkish tourists,

a functional equivalent could be used instead of a literal translation of the title *Our Lady of Minsk*, employing a more specific term that draws a cultural parallel with the veneration of Maryam (Mary) in Islam – *Virgin Mary of Minsk*.

Therefore, the following methods were used in the process of adaptation of the translated tour materials of the National Agency for Sport and Tourism of the Republic of Belarus: suggesting functional equivalent, omission, addition, specification, generalization and descriptive translation.

Conclusion

Artificial intelligence thus helps to address the challenge of cultural adaptation in tour guide discourse by suggesting explanations and alternatives for culturally marked vocabulary, identifying cultural, social or historical functional equivalents, processing a significant volume of historical and cultural information fast and efficiently. However, it is the translator who, in each specific case, decides which adaptation method to use, based on the target audience.

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AI CHANGING EDUCATION PRACTICE AND RESEARCH

ORGANIZATIONAL FRAMEWORKS FOR DEVELOPING UNIVERSITY STUDENTS' ENGLISH-SPEAKING SKILLS THROUGH CALL AND MALL

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Abstract. This article examines how organizational frameworks support university students' English-speaking skills through CALL and MALL. The study involved 23 NSTU undergraduates who completed two lessons with pre-test and post-test assessment. The results showed improvement in fluency, pronunciation, vocabulary use, and speaking confidence.

Keywords: organizational frameworks in linguodidactics; CALL; MALL; English speaking skills; higher education.

ОРГАНИЗАЦИОННЫЕ УСЛОВИЯ РАЗВИТИЯ НАВЫКОВ ВЛАДЕНИЯ АНГЛИЙСКИМ ЯЗЫКОМ У СТУДЕНТОВ УНИВЕРСИТЕТА ПОСРЕДСТВОМ КОМПЬЮТЕРНЫХ И МОБИЛЬНЫХ ТЕХНОЛОГИЙ

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Аннотация. В статье рассматривается, как организационные условия способствуют развитию навыков устной английской речи студентов университета с помощью CALL и MALL. В исследовании приняли участие 23 студента НГТУ, прошедшие два занятия с входным и итоговым тестированием. Результаты показали улучшение беглости речи, произношения, словарного запаса и уверенности в говорении.

Ключевые слова: организационные условия изучения иностранного языка; компьютерные технологии; мобильные технологии; навыки устной речи на английском языке; высшее образование.

Introduction

One of the most complex problems, which exists in foreign language study at university level, is speaking skill development. Even when students demonstrate acceptable knowledge of grammar, reading, and receptive vocabulary, many of them continue to experience difficulties in oral interaction. Some of these challenges may include hesitation, low spontaneity, poor lexical flexibility, unstable pronunciation and uncertainty during giving oral presentations. The problem of oral English proficiency is particularly important in higher education because speaking is increasingly needed to present a point, discuss in class, work on projects and communicate professionally. CALL and MALL have been essential directions for the digital transformation of language education in recent years. To support oral development, CALL employs digital prompts, model dialogues, interactive speaking tasks and feedback supported practice. MALL enhances these opportunities by allowing learners to engage in short speaking tasks, repeated oral production, and more flexible interaction within the lesson as such with personal mobile devices [1, p. 341–356; 7, p. 65–86]. However, the pedagogical success of such technologies cannot possibly be attributed to their mere accessibility. Their educational value very much depends on the way they are organized in connection with lesson aims, task sequence, and teacher's support and feedback design [5, p. 1–20]. By organizational framework, we understand a coordinated group of pedagogical and institutional conditions that functions as guidelines under which CALL and MALL are enforced in speaking instruction. This framework encompasses the following aspects: alignment of digital tools with instructional objectives, sequencing of speaking tasks, teacher-guided participation and organization of feedback in the context of class process. By organization framework, we mean a systematized set of instructional and institutional features that work as rules under which CALL and MALL are implemented in speaking education. This framework covers: digital tool alignment with instructional objectives, speaking task sequencing, teacher-guided engagement and feedback organization within the class process.

Theoretical framework

The theoretical basis of this study combines research on CALL, MALL, digital speaking practice, and higher education technology integration. Recent studies indicate that CALL can support oral development by providing learners with guided interaction, repeated rehearsal, multimedia prompts, and opportunities to produce spoken output in structured conditions. Dialogue-based systems and digital speaking environments are especially effective when they are aligned with oral

learning objectives and when students are provided with clear, manageable speaking tasks [2, p. 71–96; 4, p. 296–320]. CALL is complemented with MALL for more flexibility and immediacy in speaking practice. During the lesson, rehearse short spoken activities and support pronunciation work. Studies indicate that mobile-based practice can lead to increased speaking frequency and a lowered psychological threshold for participation, especially when learners are given the opportunity to rehearse prior to public production of oral responses [3, p. 1–18; 7, p. 65–86]. Nonetheless, if MALL is simply integrated as an accidental technical tool rather than pedagogically embedded in the classroom, it may be no more than touching upon another problem. Teacher mediation is also critically important. The work on higher education digital competence suggests that educationally goal-oriented sustainable technology integration is possible only when teachers master the deployment of digital procedures, participation modeling, task progression regulation, and artefact interpretation [5, p. 1–20]. The same conclusion can be derived from studies on automatic speech recognition and multimodal oral feedback, with the finding that digital feedback is most effective when it is supplemented with teacher explanation and opportunities to correct errors [6, p. 108–129; 10, p. 1–24]. These findings together confirm that the development of speaking skills through CALL and MALL relies not only on the tools themselves, but also on their implementation's organizational logic. Digital tasks have their best productivity when they are centered around goals, structured in terms of a sequence of learning material and assisted with teacher feedback all within the context of one instructional process. This theoretical stance underpins the classroom-based study that follows.

Methods and results

The study was conducted in April at Novosibirsk State Technical University and involved one experimental group of 23 undergraduate students. The participants represented two levels of English proficiency: 10 A2-level students and 13 B2-level students. No separate control group was included. The study adopted a pre-test/post-test experimental design in order to examine changes in students' speaking performance after the instructional intervention. The research consisted of two lessons devoted to practice speaking English. Both proficiency groups performed a similar task format, but linguistic complexity of tasks was adapted to their level. For each lesson plan, a classroom integration of CALL and MALL was proposed. CALL was conducted via digital prompts with running commentary from the teacher, model examples of speaking and structured oral tasks in class. Students' mobile phones, which were used to record short oral responses, repeat previous speaking attempts and run mobile-supported speaking activities during the lesson, facilitated MALL incorporation. The core interaction format employed in both lessons was pair speaking. Students took a pre-test and a post-test during the sessions

in order to analyze its effect. In both cases, students performed brief oral tasks on familiar academic and everyday topics. They were evaluated on four criteria: fluency, pronunciation, use of vocabulary and confidence in speaking. Each criterion was assessed on a five-point scale. The comparison of pre-test and post-test results allowed us to assess the differences in students' oral production following the two lessons. The results are presented in Table 1 and Table 2.

Table 1

Pre-test and post-test results of A2-level students' speaking performance

Criterion	Pre-test mean	Post-test mean	Improvement
Fluency	1.9	3.0	+1.1
Pronunciation	2.0	3.8	+1.8
Vocabulary use	2.5	3.3	+0.8
Confidence in speaking	2.1	3.4	+1.3

Table 2

Pre-test and post-test results of B2-level students' speaking performance

Criterion	Pre-test mean	Post-test mean	Improvement
Fluency	2.8	3.6	+0.8
Pronunciation	2.9	3.7	+0.8
Vocabulary use	2.1	3.5	+1.4
Confidence in speaking	2.6	3.8	+1.2

The comparison of pre-test and post-test results showed a positive dynamic in the students' speaking performance after the teaching intervention. It was found that while there were greater changes in fluency, pronunciation, vocabulary use and confidence variables among test scores, the degree of change varied with criteria used to evaluate and the level of learners. The observed changes suggest that the instructional sequence created favorable conditions for oral development. The improvement in fluency may be associated with repeated speaking practice and the gradual reduction of hesitation through guided oral tasks. Positive changes in pronunciation can be linked to repeated oral production and teacher-mediated correction during mobile-assisted and pair-based tasks. The development of vocabulary use appears to be related to the thematic consistency of the speaking activities and the repeated activation of lexical material across the two lessons. Growth in confidence in speaking indicates that structured participation and

mobile-supported speaking opportunities may reduce anxiety and support students' willingness to speak. The significance of the study from an organizational perspective was in how CALL and MALL were merged into one coherent classroom model. The digital activities were appropriately associated with the lesson objectives and involving computer-based and mobile-assisted tasks as one instructional unit rather than separate or isolated exercises. The teacher still had responsibility for explaining content, timing, regulating participation and providing feedback which all ensured pedagogical continuity. Also, using mobile phones in the classroom led to an increase in speaking opportunities while at the same time keeping teaching away from teacher-centered learning. The findings therefore support the view that the effectiveness of CALL and MALL in speaking instruction depends on organizational coherence. In the present study, this coherence was expressed in clearly defined oral objectives, continuity in task-parts, integration of pair speaking and digital activities and a structured teacher mediation. Such an organizational model transforms digital tools from auxiliary classroom resources into meaningful instruments of oral development. The same is true in higher education, where we must balance technological innovation with pedagogical control and academic goals when teaching speaking.

Conclusion

This study has demonstrated that the university students' development of English-speaking skills through CALL and MALL, is significantly dependent on the organizational design of instruction. Comparing the pre-test and post-test showed positive trends in aspects such as fluency, pronunciation, vocabulary use and speaking confidence after two classroom lessons that integrated digital speaking tasks. Findings suggest that technology impacts oral development significantly when embedded in an integrated organization. The framework of this present study, consisted of goal-oriented task design, integration of CALL and MALL in a single classroom sequence, pair speaking and structured teacher feedback. Such a model is pedagogically rich because it allows for maintained continuity, guidance and academic relevance while giving students more opportunities to practice orally. Thus, the idea of CALL and MALL for enhancing university students' English-speaking is not only a methodological issue but also an organization problem in higher education. Further studies could focus on how these organizational models work at various stages of proficiency and across different institutional settings.

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TASK-BASED LANGUAGE LEARNING IN THE AGE OF ARTIFICIAL INTELLIGENCE: OPPORTUNITIES FOR DEVELOPING COMMUNICATION SKILLS

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Abstract. This study examines how artificial intelligence from the application of task-based learning can enhance oral communication skills in a foreign language. Task-Based Language Teaching is supported by AI since it creates interactive environments that provide feedback immediately. A quasi-experimental research of the A2-level learners of the Novosibirsk State Technical University reveals significant income in fluency, interaction, and pronunciation. These findings indicate that AI-enriched task-based learning is a useful method to develop communicative competence among early-stage learners.

Keywords: artificial intelligence; task-based learning; communication skills; language education; digital pedagogy.

ЗАДАЧНО-ОРИЕНТИРОВАННОЕ ОБУЧЕНИЕ ЯЗЫКУ В ЭПОХУ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА: ВОЗМОЖНОСТИ РАЗВИТИЯ КОММУНИКАТИВНЫХ НАВЫКОВ И УМЕНИЙ

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Аннотация. В исследовании рассматривается, как искусственный интеллект, применяемый в рамках задачно-ориентированного обучения, может улучшить навыки устной коммуникации на иностранном языке. Обучение языку на основе задач поддерживается ИИ, поскольку он создает интерактивную среду, обеспечивающую немедленную обратную связь. Квазиэкспериментальное изучение студентов уровня А2 Новосибирского государственного технического университета выявило значительное улучшение беглости речи, интерактивности и произношения. Результаты показывают, что обучение на

основе задач с использованием ИИ является полезным методом развития коммуникативных навыков и умений у студентов на начальном этапе обучения.

Ключевые слова: искусственный интеллект; задачно-ориентированное обучение; коммуникативные навыки; языковое образование; цифровая педагогика.

Introduction

Language is changing radically in the age of artificial intelligence. Digital technologies in particular the tools that are based on AI are transforming the way in which learners approach language and construct communicative competence. Recent research indicates that AI can be used to offer adaptive feedback, enhance learner agency, and result in engagement during language learning situations.

Task Based Language Teaching (TBLT) is generally known to be a successful strategy towards building communicative competence by using significant engagement and practical duties. Its learner-oriented nature particularly translates it into being highly compatible with new technologies.

Nevertheless, when the AI and the TBLT become increasingly popular research, most studies examine them independently. There is also a paucity of empirical data on the successful application of AI to combine with task-based learning and achieve oral communication skills, particularly in the learning of A2-level learners in technical university institutions.

This gap is addressed by discussing the efficacy of task-based learning with the use of AI in enhancing oral communication abilities among A2-level learners at Novosibirsk State Technical University. It analyzes the usefulness of AI, in particular, ChatGPT Voice, in terms of its ability to assist fluency, accuracy, and interaction during speech.

Theoretical framework

TBLT has a premise that language is a result of meaningful interaction and communication. It concentrates on applying real and goal-oriented activities reflecting situations people encounter in their daily lives and challenging learners to think primarily about meaning rather than about individual instances of language structure.

One of the major characteristics of TBLT is that the primary unit of teaching is tasks. Students address problem-solutions, role-plays and discussions. Such activities serve a communicative role and promote negotiating meaning. TBLT is learner centered. It shifts the teacher-centered teaching to participation by students. Students work in groups, communicate, and also assume control of their language development.

TBLT is a three-stage process consisting of pre-task, task cycle and post-task stages. Relevant context and vocabulary is provided by the pre-task stage. The task cycle provides the learners with an opportunity to act and interact. Post task phase provides a feedback and reflection, which promotes fluency as well as gradual accuracy.

It can be particularly beneficial in the A2 level, as students require a regular opportunity of practicing the simplest communication in meaningfully constructed environments. In the meantime, artificial intelligence has emerged as an effective tool in learning languages that offers real-time interaction, feedback that is adaptive, and increased opportunities to speak. Technology (such as ChatGPT Voice) allows the learner to have a constant conversation and receive immediate answers.

The integration of AI and TBLT results in an exciting learning environment, which increases the level of learner autonomy, improves the interaction level, and builds oral communication.

Methods and results

A2-level undergraduates in the Novosibirsk State Technical University were the subject of the study. To measure their oral communication, a quasi-experimental research design, including a pre-test, and a post-test was used.

Some of the AI tools that we took into consideration included ChatGPT Voice, ELSA Speak, Gliglish, Talkpal AI, and SmallTalk2Me. Finally, we decided to use ChatGPT Voice since this option can be interacted with in real-time, works in a pair mode, and offers adaptive feedback.

TBLT was used as the framework of instruction that consisted of preparation, task performance, and feedback. Learners collaborated in pairs through a common device, and by using the AI, they did communicative assignments such as role plays and discussions.

The oral performance was assessed in terms of fluency, accuracy, and interaction on a five-point scale (see the Table below).

Table 1

Improvement in student’s oral communication skills

Criterion	Pre-Test Mean	Post-Test Mean	Improvement %
Fluency	2.6	4.1	57.7%
Accuracy	2.8	3.6	28.6%
Interaction	2.5	4.0	60.0%

The results show significance improvement in fluency and interaction, while accuracy improved moderately, confirming the effectiveness of AI-enhanced task-based learning.

Conclusion

This study shows that adding artificial intelligence to Task-Based Language Teaching greatly improves A2-level learners' ability to speak. The results show that fluency and interaction have improved a lot, while accuracy has only improved a little. This shows that AI-supported communicative practice works. Even though the sample size was small, the results show that AI has a lot of potential as a teaching tool for language learning in Educational Technology.

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STRATEGIES FOR INTERACTING WITH ARTIFICIAL INTELLIGENCE IN DIFFERENT IT SPECIALIST TRAINING COURSES

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Abstract. The paper analyzes strategies of interaction of IT students with generative AI tools depending on the year of study. Based on a survey, four strategies are empirically identified. It is shown that a key marker of professional maturity is the ability to modify the prompt in case of an error and to differentiate tools for different tasks.

Keywords: artificial intelligence in education; generative neural networks; prompt engineering; interaction strategies; IT education.

СТРАТЕГИИ ВЗАИМОДЕЙСТВИЯ С ИСКУССТВЕННЫМ ИНТЕЛЛЕКТОМ НА РАЗНЫХ КУРСАХ ОБУЧЕНИЯ ИТ-СПЕЦИАЛИСТОВ

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Аннотация. В статье анализируются стратегии взаимодействия студентов ИТ-направлений с генеративными ИИ-инструментами в зависимости от курса обучения. На основе опроса эмпирически выделены четыре стратегии. Показано, что ключевым маркером профессиональной зрелости является способность изменять промпт при ошибке и дифференцировать инструменты под разные задачи.

Ключевые слова: искусственный интеллект в образовании; генеративные нейронные сети; промпт-инжиниринг; стратегии взаимодействия; ИТ-образование.

Introduction

Artificial Intelligence (AI) tools, particularly generative neural networks, are rapidly integrating into programming education. Students across all academic years use these tools, in one way or another, for writing, debugging and explaining code. However, pedagogical approaches to working with AI lag behind technological progress.

The absence of a typology of student-AI interaction strategies creates ambiguity regarding how these strategies evolve as students advance from one academic year to the next. Moreover, prompt engineering instruction remains standardized, failing to account for students' varying levels of proficiency.

This study aims to identify and describe the strategies of AI interaction among IT students and to establish a correlation with their year of study.

The scientific novelty of this work lies in developing a course-based typology of AI interaction strategies for students in IT specializations.

Theoretical framework

Study [1] conducted an experiment with 20 novice programmers. A quantitative analysis of 1,946 prompts and a qualitative analysis of 1,080 prompts revealed two stable patterns. The first pattern consists of a template phrase "doing this now" (30% of prompts): students copy the generated code without modification. The second pattern is "step-by-step" (46% of prompts): students break a task into sub-steps and query the AI for each sub-step. The remaining 24% represent mixed patterns.

The authors established that novice programmers rarely reformulate prompts when encountering errors. In 68% of cases where the AI returns an incorrect response, students either accept the response or discontinue interaction with the AI. Only 32% attempt to modify their query.

In study [2], the participants were 40 engineering students. The authors identified three types of prompt strategies:

1. Information seeking – 48% of prompts (queries for facts, formulas, algorithms);
2. Execution – 39% of prompts (direct requests to solve a problem);
3. Help seeking – 13% of prompts (requests for explanation or hints).

This study did not analyze the relationship between these strategies and the year of study. According to the article, all participants were junior students.

The experiment described in study [3] involved 120 students and examined four groups of students. Groups 1 and 2 received structured prompt training (8 hours, 4 modules). Groups 3 and 4 served as control groups. The results of this experiment show that prompt training improved programming and data analysis skills (Cohen's $d=0.78$ and 0.65 , respectively). The effect persisted after six weeks (0.71 and 0.59 , respectively). This experiment did not specify any differentiation of the effect by year of study, since all participants were second-year students.

The authors of course [4] developed a methodology that includes three metacognitive competencies: decomposing tasks into sub-steps, evaluating generated code, and integrating code fragments into a working solution. The course targets beginners. The authors provide no data on adapting the course for senior students.

The review article [5] summarizes 72 studies published between 2022 and 2025 on large language models (LLMs) in programming education. The key findings are as follows: 86% of the works measure AI effectiveness (speed, accuracy, satisfaction); 12% of the works analyze the impact on learning (knowledge transfer, long-term retention); 3% of the works investigate interaction strategies.

A bibliometric analysis of 486 publications from the Scopus database covering 2022-2024, presented in study [6], shows that the annual growth rate of publications on ChatGPT in programming education reached 340%. The key thematic clusters include AI tutors (38% of publications), tool support (35% of publications), and ethical aspects (27% of publications). The analysis does not identify any typologies of interaction strategies within these clusters.

The developers of an AI literacy program for university students, in study [7], described a methodology comprising four modules: conceptual understanding, AI literacy, empowerment, and ethical awareness. The study results show a significant increase across all four components ($p < 0.001$, Cohen's $d = [0.52; 0.84]$). The authors did not analyze differences by year of study. The average age of participants was 20 years, corresponding to years 2-3 of study.

Methods and results

Eighty-four undergraduate students from years 1 to 4 participated in the survey. All participants major in IT-focused programs: “Computer Science and Engineering” and “Applied Informatics”. The survey was anonymous and voluntary.

To study the correlations, we selected the year of study (1–4) as the independent variable. The dependent variables include the frequency of AI use across six tasks (5-point scale), response verification (yes/no), frequency of prompt modification (4-point scale), and the number of tools used. We operationalized strategies along three dimensions: tool breadth (number of AI tools), task coverage (types of tasks), and regulatory depth (verification and prompt modification). Fig. 1 presents the correlation matrix based on Spearman's coefficients.

Based on the survey data, we identified four strategies:

Consumer strategy – 1-2 tools (typically ChatGPT), code generation, little or no verification, no prompt modification. Typical year of study: 1-2;

Instrumental strategy – 3 or more tools, generation and debugging, verification present, rare prompt modification. Typical year of study: 2-3;

Reflective strategy – 2-3 tools with an emphasis on explanation and debugging, verification present, regular or frequent prompt modification (3-4 year of study).

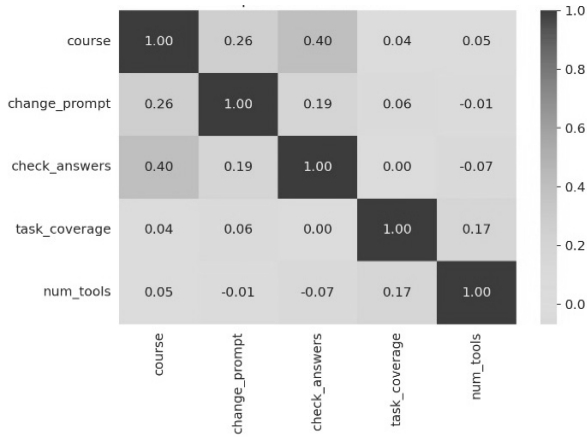


Fig. 1. Correlation matrix

Hybrid-expert strategy – differentiates tools by task (Cursor for code, DeepSeek for explanations, PlantUML for diagrams), covers all tasks except report writing, verification present, regular or frequent prompt modification. Typically fourth-year students.

Correlation analysis revealed the following relationships. The year of study correlates positively with the frequency of prompt modification ($\rho=0.263$, $p=0.017$). The year of study correlates with response verification ($\rho=0.380$, $p=0.0004$). The correlation between prompt modification and response verification is not statistically significant ($\rho=0.191$, $p=0.086$). The year of study does not correlate with the number of tools used ($\rho=0.029$, $p=0.792$). Although response verification increases with the year of study, this represents a passive skill – it does not occur alongside a comparable increase in prompt modification. Senior students verify responses more often, but prompt modification in the event of an error grows more slowly. Table 1 shows the distribution of strategies by year of study in percentages.

The share of the consumer strategy decreases from 45.5% in the first year to 6.3% in the fourth year. The share of the hybrid-expert strategy increases from 9.1% to 37.5%. The reflective strategy peaks in the third year (38.9%) and then declines slightly (33.3% in the fourth year).

Conclusion

The conducted study identified four strategies of AI interaction among IT students using generative AI tools: consumer, instrumental, reflective, and hybrid-expert. These strategies distribute systematically across years of study.

The share of the consumer strategy decreases from 45.5% in the first year to 6.3% in the fourth year. The share of the hybrid-expert strategy increases from 9.1% to 37.5%.

Table 1

Distribution of strategies by year of study

Year of study	Consumer	Instrumental	Reflective	Hybrid-expert
1	45.5	36.4	9.1	9.1
2	25	41.7	16.7	16.7
3	11.1	27/8	38.9	22.2
4	6.3	22.9	33.3	37.5

Correlation analysis confirmed a relationship between the year of study and the frequency of prompt modification in the event of an error ($\rho=0.263$, $p=0.017$). Senior students reformulate their queries significantly more often when the AI returns incorrect responses. Response verification correlates with the year of study more strongly ($\rho=0.380$, $p=0.0004$), but this increase does not coincide with an adequate growth in prompt adaptability – this represents a passive skill.

The number of AI tools used does not correlate with the year of study ($\rho=0.029$, $p=0.792$). Professional maturity manifests not in the breadth of one's toolset but in the ability to differentiate tools for specific tasks and to adapt prompts when encountering errors.

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GAMIFYING FRENCH LESSONS: HOW INTERACTIVE ACTIVITIES SUPPORT LEARNING AND STUDENT ENGAGEMENT

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Abstract. This study explores the impact of gamified digital activities on undergraduate students' engagement, motivation, and grammatical understanding during a French lesson focusing on active and passive voices. The findings highlight that gamified approaches can contribute to learning French as a foreign language.

Keywords: gamified digital activities; French as a foreign language; grammar; engagement; motivation.

ГЕЙМИФИКАЦИЯ УРОКОВ ФРАНЦУЗСКОГО: КАК ИНТЕРАКТИВНЫЕ ЗАНЯТИЯ СПОСОБСТВУЮТ ОБУЧЕНИЮ И ВОВЛЕЧЕНИЮ ОБУЧАЮЩИХСЯ

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Аннотация. В этом исследовании изучается влияние геймификации на вовлеченность, мотивацию и понимание грамматики студентами во время урока французского языка. Результаты исследования

показывают, что игровые подходы могут способствовать изучению французского языка как иностранного.

Ключевые слова: геймифицированные цифровые обучающиеся мероприятия; французский как иностранный язык; грамматика; обучение; мотивация.

Introduction

Gamification has become a widely recognized strategy in language education, offering opportunities to increase student engagement, motivation, and skill acquisition [2]. While prior research often addresses general foreign language instruction, few studies have investigated the use of gamification in specific grammatical instruction in French [4]. The active and passive voice represent a particularly challenging area of French grammar, as learners must understand both syntactic structures and their functional use in context [5, 7]. Students often struggle to apply these structures correctly in written and oral communication. To address these challenges, this study implemented gamified digital activities designed to foster engagement, provide immediate feedback, support oral practice, and encourage reflective thinking about grammatical choices. The primary objective was to investigate how these activities influence student engagement, motivation, comprehension of active and passive constructions, and oral participation during a French lesson.

Theoretical framework

Gamification incorporates game-like elements, such as points, challenges, and immediate corrective feedback, into educational contexts to foster active participation and sustained motivation [9]. In French language education, gamified digital activities can enhance both comprehension and practical application of grammatical structures by combining interactive exercises, multimodal input, and opportunities for reflection [3]. Recent research emphasizes the role of AI-supported tools in providing instant corrective feedback, which helps learners consolidate knowledge while maintaining engagement [2, 4]. Despite these benefits, challenges such as technological reliability, concentration difficulties, and variable oral confidence remain important considerations. Using both quantitative and qualitative data provides a richer understanding of the pedagogical opportunities and limitations of gamified instruction in online language learning [3].

Methods and results

The study was conducted during a French lesson for eight undergraduate students training to become French language teachers. The lesson focused on the active and passive voices, which often present difficulties in both structural transformation and functional use. The session included video examples, guided explanations, and interactive gamified exercises delivered through the digital

platforms AlloFLE [1] and Salle110 [8], providing immediate feedback, sentence-construction tasks, and opportunities for oral participation. These activities aimed to support engagement, trial-and-error learning, and reflection on grammatical choices. Data were collected anonymously via Google Forms. The questionnaire included six Likert-scale items assessing engagement, grammar clarity, oral comfort, immediate feedback, motivation, and reflective thinking, along with one open-ended question on the most useful or challenging aspects of the activities. Quantitative responses were analysed by calculating mean scores, while qualitative responses were analysed thematically to identify recurring patterns, reflecting opportunities and challenges [3]. The quantitative results (see table below) indicate high scores for immediate feedback (4.8) and motivation (4.6), with slightly lower scores for engagement (4.3) and reflective thinking (4.1). Grammar clarity averaged 3.9, and oral comfort was the lowest and most variable (3.1).

Table 1

Quantitative Findings

Question / Theme	Mean Score (1–5)	Observation Trend
Engagement (Q1)	4.3	High
Grammar clarity (Q2)	3.9	Moderate
Oral comfort (Q3)	3.1	Mixed
Immediate feedback (Q4)	4.8	Very High
Motivation (Q5)	4.6	Very High
Reflective thinking (Q6)	4.1	High

Qualitative analysis indicated that students valued **immediate feedback**, **trial-and-error learning**, and **video-based exercises**. The activities promoted conscious reflection on grammar. Challenges included **internet connectivity issues**, **concentration difficulties**, and variable **oral participation**. Overall, gamified activities improved engagement and reflection but required **teacher support** and reliable technology [2, 3].

Conclusion

Gamified digital activities in a French lesson focusing on active and passive voice enhanced student engagement, motivation, and reflective learning. Immediate feedback was particularly influential in supporting comprehension and correct application of grammatical structures. However, variability in oral confidence and moderate clarity in grammar indicate the continued need for teacher guidance and

dependable technological resources. These findings suggest that gamification should be regarded as a pedagogical enhancement, complementing rather than replacing direct instructional support [9, 7].

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AI IN PROJECT-BASED TRANSLATION TRAINING: FOSTERING INTERCULTURAL COMPETENCE

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Abstract. This study investigates the role of AI integration in Project-Based translation training to foster intercultural competence among translation students. A dedicated surveyed students' use of digital tools in professional workflows, revealing the role of AI. This paper provides analysis of the given data and determines how AI is usually implemented in translating cultural-specific texts.

Keywords: translation competence; intercultural competence; translation studies.

ИИ В ПРОЕКТНО-ОРИЕНТИРОВАННОЙ ПОДГОТОВКЕ ПЕРЕВОДЧИКОВ: ФОРМИРОВАНИЕ МЕЖКУЛЬТУРНОЙ КОМПЕТЕНЦИИ

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Аннотация. Исследование посвящено изучению роли интеграции ИИ в проектно-ориентированное обучение переводу для формирования межкультурной компетенции у студентов-переводчиков. Проведено анкетирование относительно использования цифровых инструментов в процессе перевода, что позволило определить роль ИИ в данном процессе. В работе представлены анализ полученных данных и определение особенностей применения ИИ при переводе культурно-специфических текстов.

Ключевые слова: переводческая компетенция; межкультурная компетенция; переводоведение.

Introduction

Translation, as a professional practice, has undergone drastic changes across centuries. In the contemporary era – defined by globalization, digitalization, and artificial intelligence (AI) – the demand has surged for translators skilled in intercultural mediation amid rapid technological shifts. Translation competence encompasses core components, with intercultural competence being practically essential. A professional translator has to be able to possess vast extralinguistic knowledge, focusing on cultural interaction, the translator's mediatory role, and cultural identity. Translation training must therefore adopt flexible, adaptive methodologies to address diverse challenges effectively.

Theoretical framework

Translation training in a modern world is based upon student-centered approach focusing on independent autonomous learning. This foundational idea was first articulated by James S. Holmes, a pioneer of Translation Studies, who identified the process-oriented branch within Descriptive Translation Studies (DTS), emphasizing the translator's internal cognitive processes. [2]. These foundational concepts established translation competence as the cornerstone for training future translators.

Translation competence constitutes a complex integrated ability that encompasses mobilization, organization, and effective deployment of multi-level knowledge as well as cognitive, affective, psychomotor skills including expertise within specific professional contexts [1]. The notion of competence extends beyond mere possession of requisite professional skills to include a commitment to continual daily learning and professional refinement [4, p. 58].

Translation competence is a complex notion containing several layers of meaning. This study adopts the PACTE model's five interrelated sub-competencies to structure translator training [3]. This model identifies the following components: bilingual, extralinguistic, translatory, instrumental and strategic. Extralinguistic sub-competence is a component encompassing world knowledge, intercultural differences, and domain expertise. Unlike bilingual competence, it provides essential cultural-contextual understanding for interpreting cultural realia accurately. Such a complex components requires specialized training methodology.

Project-Based learning in translation training effectively develops extralinguistic (intercultural) competence through its inherent scaffolding rooted in constructivist principles. Digital technologies enable individualized learning paths by integrating tools like CAT systems, machine translation, and AI [5]. This approach transforms abstract cultural knowledge into practical decision-making skills. Teachers must leverage digital tools to enhance interaction and build translation skills through progressively challenging tasks. Task complexity increases by requiring students to focus on specific translation decisions – beyond merely submitting given tasks, they must justify their choices. This scaffolding approach fosters metacognitive reflections essential for professional competence.

Methods and results

This study analyzes questionnaire data collected within a broader pedagogical experiment evaluating a digital course on intercultural competence development. The questionnaire specifically examines students' use of translation tools during course completion, including both traditional CAT systems and AI-driven solutions. Its design enables measurement of preference shifts from conventional tools toward AI integration, providing insights into evolving translation technology adoption patterns.

The questionnaire involved 19 third-year students from Novosibirsk State Technical University, enrolled in Linguistics program (45.03.02 specialization, Translation and Translation Studies profile). This participants selection was deliberate, targeting students at a training stage where they had already mastered foundational linguistic and translation competencies and were transitioning to specialized professional development.

Translation students demonstrate a hybrid tool adoption, with 36.8% favouring TM/MT/AI workflows – far exceeding expectations for undergraduates and signalling readiness for professional environments. This preference surpasses pure machine translation (21.1%) and MT in combination with post-editing (21.1%), while manual translation registers a mere 5.3%, revealing students' pragmatic recognition that tool efficiencies outweigh purist manual approaches in real-world constraints.

MT usage patterns reveal the following: 100% of users limit inputs to short textual segments (52.6% single sentences/phrases under 50 words, 47.4% short paragraphs of 50-200 words), while avoiding using MT in translating entire documents. Perceived effectiveness is moderate (63.2%), with 26.3% finding it only slightly effective and 10.5% rating it fully effective. This shows students' certain distrust towards MT in handling large volumes of texts but requires human oversight for nuance.

Post-editing priorities presented in Table 1 show us what aspects are viewed as the most essential in translation workflow:

Fluency dominates (27.9%), followed closely by semantic accuracy (21.3%) and cultural adaptation (19.7%). These three priorities amount to 68.9%, underscoring intercultural competence as the pivotal post-editing skill.

Translation Memory reveals a concerning adoption gap: 43.5% rarely/never use TM, preferring manual methods, while 26.1% deploy it for repetitive texts and 21.7% combine it with MT fuzzy matches. This lack of utilization persists despite 42% rating TM/CAT tools "quite/moderately convenient", suggesting pedagogical blind spots in CAT tool scaffolding.

AI application show pragmatic diversification in answers: 30% leverage it for high-volume drafting, 23.3% for terminology research, and 16.7% for grammar, though 13.3% remain skeptical. Effectiveness perception revolves around repetitive

texts (37.9%), with balanced recognition of drafting speed (17.2%), post-editing accuracy (17.2%), and TM synergy (17.2%) – preferring hybrid models while 10.3% prefer traditional workflows.

Table 1

Post-editing priorities

Priority	Responses	Total Percentage
Fluency/natural phrasing	17	27.9%
Mistranslation/word choice	13	21.3%
Cultural specifics/realia	12	19.7%
Style/tone/register	11	18.0%
Grammar/syntax	6	9.8%
Formatting	1	1.6%
No post-editing	1	1.6%

Convenience rating presented in Table 2 reveal translation workflow preferences among the students:

Table 2

Translation Tools Convenience Rating

Translation Tool	Extremely Convenient	Quite Convenient	Moderately Convenient
Hybrid (TM, AI, manual)	36.8%	26.3%	26.3%
Manual	5.3%	47.4%	31.6%
MT, Post-editing	5.3%	31.6%	63.2%
TM/CAT	10.5%	31.6%	31.6%

Translation students allocate 49.2% of their total working time to manual translation, confirming its dominance despite technological alternatives, followed by 26.8% machine translation combined with post-editing, 4.7% TM/CAT tools as primary method, and 19.3% AI tools thus revealing hybrid workflows where manual effort is the basis of professional judgment.

Based on the data, presented in Table 3, 47% of respondents prefer manual-dominant translation methods where manual translation takes 68% of the workflow – MT (15-25%) and AI (5-10%) are seen as aids rather than workflow drivers aligning with traditional training methodologies. On the other hand, 37% of

the students allocate their workflow the following way: 30–50% for manual translation, 25–55% for MT and post-editing with 10-30% belonging to AI tools.

Table 3

Time Allocation of Translation Workflow

Translation Tool	Percentage	Range
Manual Translation	49.2%	20-80%
MT, Post-editing	26.8%	10-70%
TM/CAT Primary	4.7%	0-18%
AI tools	19.3%	0-70%

Conclusion

AI functions best as a scaffolding drafting aid within Project-Based curriculum – preceded by realia extraction and followed by terminology validation and peer-reviewed post-editing. Translation students intuitively adopt AI tools for drafting but neglect TM tools. Manual translation dominates despite technological alternatives, indicating persistent craft-based training paradigms. Students understand AI tools as supplementary measures utilized in translation in order to successfully navigate in cultural-specific contexts and make adequate and appropriate translation decisions.

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THE EFFECTIVENESS OF USING GAMIFIED TASKS GENERATED BY ARTIFICIAL INTELLIGENCE IN THE EDUCATIONAL PROCESS

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Abstract. This article explores how combining gamification with artificial intelligence can fundamentally reshape the way we teach and learn. By turning learning into a game-like experience, educators can spark genuine motivation and keep students actively involved. At the same time, AI makes it possible to automatically generate personalized tasks that adapt precisely to each student's current knowledge and unique way of learning.

Keywords: artificial intelligence; gamification; student engagement; educational process.

ЭФФЕКТИВНОСТЬ ИСПОЛЬЗОВАНИЯ ГЕЙМИФИЦИРОВАННЫХ ЗАДАНИЙ, СОЗДАННЫХ ИСКУССТВЕННЫМ ИНТЕЛЛЕКТом, В ОБРАЗОВАТЕЛЬНОМ ПРОЦЕССЕ

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Аннотация. В этой статье рассматривается, как сочетание геймификации с искусственным интеллектом может коренным образом изменить методы преподавания и обучения. Превратив обучение в игровой процесс, педагоги могут вызвать подлинную мотивацию и поддерживать активное участие учащихся. В то же время, ИИ позволяет автоматически генерировать персонализированные задания, которые точно адаптируются к текущим знаниям каждого ученика и его уникальному стилю обучения.

Ключевые слова: искусственный интеллект, геймификация, вовлеченность студентов, образовательный процесс.

Introduction

In the context of the steady development of the digital environment and the widespread adoption of distance learning, the use of gamification and artificial intelligence in the educational process is a relevant and rapidly developing area. The primary goal of education today is to improve student learning outcomes, engagement, and interest in learning. To effectively organize the educational process, it is important to create a comfortable environment for students and diversify the learning process.

One of the most effective way to solve this problem is recognized as gamification – the introduction of game elements into a non-game learning context. Many studies show that well-designed gamified tasks increase student engagement and improve subsequent test results. [2] However, this approach has certain limitations. Creating high-quality, variable, and adaptive game content requires significant time investment and game development skills from teachers.

In the last few years, the situation has changed dramatically with the advent of artificial intelligence. Generative neural networks can generate text questions, scenarios, stories, and complete quizzes with game mechanics in a split second, adapting to a given topic, difficulty level, and style.

Many authors have covered various aspects of the application of gamification, including integration with artificial intelligence in the educational process. Gamification as an innovative method is considered in the works of M.V. Vasilizhenko, E.A. Korotkov [8], M.A. Hlybova [4], and Marta Kopinska [5] discuss the issues of the importance of gamification. Thus, the use of gamification and AI for student engagement is considered by Ya.O. Ozhiganova [6].

Theoretical framework

Gamification means bringing game elements like points, badges, leaderboards, instant feedback, and web quests into regular lessons. This approach really helps boost students engagement and motivation, turning ordinary learning into something far more interesting and effective.

M.A. Khlybova's research emphasizes that gamification primarily helps students achieve course educational goals and maintain interest and motivation [4].

In her work, E.K Yusupov emphasizes that gamification elements optimize the learning process and implement essential didactic principles, such as awareness, activity, individualization and consistency [9].

The integration of gamified assignments and generative neural networks creates a pedagogical tool that can improve the learning process. Traditional gamified assignments require time and specific design skills [8].

Carlos J. Costa claims in his research, that artificial intelligence brings a number of benefits to gamification, including data-driven personalization, predictive

modeling, and real-time adaptiveness. The integration of gamification and AI opens up opportunities for creating personalized and adaptive elements. For example, mathematical models are key to optimizing reward systems, predicting engagement, and developing skills [1].

Furthermore, bringing competitive game elements into lessons can help ease the anxiety that often comes with making mistakes especially when students are tackling new vocabulary or tricky grammar rules. As that pressure drops, learners tend to speak more freely and naturally, which strengthens their verbal fluency over time. Quizzes, in particular, play a key role by boosting motivation and encouraging students to jump in and participate actively during class.

Quizzes engage even passive students, as everyone wants to contribute to the team's success or test himself or herself. In addition, questions are often based on examples from previous topics, which help reinforce words and phrases in a situational context rather than in isolation [10].

Creating high-quality quizzes for English lessons requires careful preparation on the part of teachers. First, teachers need to define the quiz's thematic boundaries, highlighting the key vocabulary and grammar components that will be tested. Then, when creating quizzes, it's important to consider the type of tasks that will align with the lesson objectives. Creating good quizzes for English lessons takes real thought and preparation from the teacher. First, you need to clearly define the topic and scope of the quiz decide exactly what vocabulary and grammar points you want to test and make sure everything stays within those boundaries.[7]

Next, think carefully about the types of tasks that will best match your lesson objectives. Should you use multiple choice, matching exercises, fill-in-the-blanks, short answers, or something else? The format should feel purposeful, not random. When everything is planned properly, the quiz becomes a much more effective tool for checking real progress rather than just another routine exercise [3].

For this reason, the decision was made to conduct an experimental study. For this experiment, the role of quiz generator was transferred to artificial intelligence. The key objective of the experiment was to empirically test the effectiveness of a quiz generated entirely by a neural network, without direct manual intervention by the teacher, in terms of learning and subsequent recall of educational material. The results of this comparison will allow us to evaluate the potential of AI as an auxiliary tool in English language teaching.

Methods and results

To conduct the experimental study described in the previous section, a group of non-linguistic students was recruited. The respondents were first-year students majoring in Conflict Studies. Since English is not a core subject for this category of students, special requirements were imposed on the development of the teaching

materials: simplicity of content, accessible linguistic structures, and the inclusion of elements that promote cognitive interest and engagement in the learning process.

"Travelers' Tales" was chosen as the core topic of the lesson. Within this framework, the students were previously familiarized with several texts describing various travel stories and situations that arise during travel. In preparation for the experiment, a lesson objective was formulated, with particular emphasis on the following: By the end of the lesson, students will be able to integrate narrative opening strategies, establishing temporal connections, and plot prediction skills to write their own coherent travelogue.

The quiz was generated using artificial intelligence (DeepSeek) based on specially designed prompts. The basic prompt stated: "You need to create a game with several categories of questions with different points for each according to this topic."

The prompt also included photos that illustrated the topic, along with short related texts and lists of new vocabulary. The quiz itself was set up as a team competition. Each team could pick a category and choose how many points they wanted to go for – from 100 to 500. There were four categories in total: Travelers Problems, The Beginning of the Story, Sequence of Events, and What Happens Next? For instance, in the first category, students had to show they understood the main conflicts in passages A through D. A typical 100-point question might be: In story A, what two things did the travelers run out of?

During the development of the artificial intelligence, the need for partial support and adjustments became apparent. Some question categories proposed by the neural network did not fully correspond to the original objective of the lesson. Therefore, a number of clarifying requests were made with the aim of replacing or adapting tasks that were considered not to quite correctly reflect the purpose of the lesson. Thus, the final version of the quiz was the result of a combination of automatic generation and expert pedagogical evaluation.

A comparison of the two versions of the first category, which was conducted during the quiz's development, deserves special attention. The original version was called "Where Are They?" and contained questions about recognizing places based on indirect clues. However, after analyzing the lesson objectives, this option was replaced with the "Travelers' Problems" category. The reason for this change was that the first option only tested superficial understanding and did not prepare students for a productive written assignment, while the final option required analyzing cause-and-effect relationships, understanding text details, and generalizing. Furthermore, the questions in the replaced category used the necessary vocabulary from the lesson. Therefore, the final option proved methodologically more accurate, as it modeled the structure of a story through conflict—something the students were required to consider when writing the final written assignment.

The results of the experiment show that the stated objectives were successfully achieved. The quiz created using artificial intelligence and with minor adjustments made by teachers, demonstrated a significant increase in participant engagement.

Even though English is not the students first language and their level is still quite limited, they were really interested in this quiz format. Almost everyone in the group got actively involved, including the kids who usually stay quiet or passive during regular lessons. The competitive, game-like atmosphere made a big difference.

What impressed me most was how well they used what they had read beforehand. They moved through the texts confidently, quickly finding the details they needed to answer the questions. It showed that this kind of quiz isn't just fun it actually helps turn passive reading into active engagement and strengthens their reading comprehension skills.

Conclusion

The main goal of this study was to check whether gamified tasks created with the help of artificial intelligence actually work well when teaching English to students.

The target audience were first-year students majoring in conflict resolution, for whom English is not their primary subject. The experiment focused on the "Travelers' Tales" section, with an emphasis on lexical units conveying temporal sequence and suddenness of action.

The study addressed the following objectives. First, based on prompts generated by the teacher, the artificial intelligence generated a quiz comprising several categories of questions with varying point values. Secondly, minor pedagogical adjustments were made to the task generated by the neural network to align it with the original lesson objective. Also, the quiz also demonstrated a high level of engagement: students actively participated in the gameplay and successfully updated and applied the knowledge gained during the study of this topic.

Thus, it can be concluded that gamified tasks created using AI can demonstrate a high level of student engagement, including those who are usually passive in classes. The game format reduces psychological barriers and increases motivation to complete tasks in a foreign language. Artificial intelligence, in turn, can serve as an effective tool for the initial generation of educational content; however, its operation requires subsequent expert evaluation and moderate adjustments by the teacher.

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ARTIFICIAL INTELLIGENCE AS AN INNOVATIVE TOOL IN TRANSLATOR TRAINING: RESULTS OF AN EXPERIMENT

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Abstract. The rapidly developing artificial intelligence technology is changing the requirements for translator training. The article is devoted to the study of AI implementation in the translation training of linguistics students. An educational experiment was conducted using an innovative tool during the completion of translation tasks.

Key words: the integration of AI into translator training; experiential learning for translation students; the advantages and disadvantages of AI-based translation training.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАК ИННОВАЦИОННЫЙ ИНСТРУМЕНТ В ПОДГОТОВКЕ ПЕРЕВОДЧИКОВ: ОПЫТ ЭКСПЕРИМЕНТА

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Аннотация. Развитие технологий искусственного интеллекта приводит к изменению требований к подготовке переводчиков и необходимости интеграции цифровых инструментов в учебный процесс. Данная статья посвящена исследованию применения ИИ в процессе обучения переводу студентов-лингвистов. Проведен педагогический эксперимент с использованием инновационного инструмента при выполнении переводческих заданий.

Ключевые слова: внедрение ИИ в обучение переводчиков; практическое обучение студентов-переводчиков; преимущества и недостатки обучения переводу с использованием ИИ.

Introduction

In conditions of rapid technological progress and globalisation, the integration of artificial intelligence (AI) into the educational process for translation is becoming

not just an innovation, but a vital necessity. This trend highlights the need to adapt curricula and review pedagogical approaches in order to train specialists capable of working effectively in a digital environment. Despite the potential of AI, the key role of the teacher remains unchanged, although it is evolving towards providing support, personalization and emotional guidance.

Theoretical framework

In recent years, translation technologies have improved significantly, providing a wide range of tools to enhance translation quality. Among the most relevant approaches are post-edited machine translation, automated assessment systems, adaptive learning, interactive educational resources, big data analysis and collaborative platforms.

The use of artificial intelligence makes it possible to develop training programmes that take into account students' individual abilities, their level of proficiency and progress, as well as to adapt tasks based on previous results. This is particularly significant in language training for professional purposes, as it allows for the flexible adjustment of the complexity of texts, exercises and audio materials. Furthermore, AI systems are capable of processing large amounts of data, identifying patterns in the learning process and contributing to future improvements [3].

In practical terms, AI can be integrated in several ways: 1) automatic translation and text analysis, enabling hypotheses to be quickly verified and material translations compared; 2) algorithms capable of providing instant feedback on grammatical, lexical and stylistic mistakes; 3) chatbots and AI assistants can simulate various situations to practice specific skills [1].

From the perspective of translation theory, the training is based on 'Skopos theory', which emphasizes that translation strategies must be determined by the purpose of the text and the target audience [4]. It also draws on the concept of equivalence, which focuses on maintaining semantic, stylistic and functional proximity between the source and target texts. In this context, AI can serve as a supporting tool for verifying the accuracy of the terminology database and identifying non-obvious errors in the transmission of meaning.

In this approach, training is a phased, practice-oriented process in which students systematically master all the key activities of a translator, with artificial intelligence serving as a supporting tool at specific stages of the work [2].

Training takes place in three stages: introductory, main and final.

1. The introductory stage, AI is used primarily as a teaching tool: it helps students understand the principles of translation, see examples and receive initial feedback.

2. The main stage, the focus shifts to the student's independent work and the practical application of skills, whilst AI is used selectively.

3. The final stage, AI is used to check, verify and assess the quality of the translation.

The learning process itself is delivered through a series of exercises that reflect the real-life professional activities of a translator.

The training continues with the post-editing stage, where students learn to work with the AI's results like professional editors: correcting mistakes, improving style and specifying terminology. This is followed by a comprehensive quality check of the translation, where AI is used to identify grammatical, spelling and stylistic omissions.

An important part of the training is the analysis and feedback stage, which helps students develop skills in self-assessment and professional reflection. The process concludes with a check for originality and compliance with academic and professional ethics.

Thus, the training involves the student not simply translating a text or using AI, but going through the full cycle of translation work: from analysis to final checking, gradually developing linguistic, analytical, critical and editing skills. AI does not replace the training process, but is integrated into it as a tool that enhances specific stages and makes the process more effective and conscious [5].

Methods and results

The experiment involved 24 2nd and 3rd-year students majoring in 'Translation and Translation Studies' who were studying French as a second foreign language, there were 12 students in the experimental group (EG) and 12 in the control group (CG).

The linguistics students completed identical translation exercises on the text 'Le mois de mai'.

The translation exercise system we have developed comprises seven steps, strictly adhering to the logic and sequence of the actions to be performed. It should be noted that the exercise system constitutes a structured set of various types, genres and forms of exercises, grouped according to their intended purpose, the material used and the methodology of execution. The aim of the system is the targeted formation and development of the necessary skills and abilities in learners across a variety of speech activities, which contributes to the attainment of a certain level of competence in this field.

An experiment was conducted to train linguistics students in translation using AI, with the aim of evaluating the effectiveness of AI in the development of professional translation skills. A French text of a cultural and historical nature on the origins of the 1 May holiday was used as source material, which made it possible to determine the extent to which AI is capable of taking into account context, idiomatic expressions and the specifics of cultural realities.

To evaluate the quality of the translation and identify the advantages and disadvantages of the proposed system of exercises integrating chatbots into the translation training process compared to manual translation, we conducted a comparative analysis. The results are presented in Table 1.

Table 1

A comparative analysis of translation quality between manual translation and the use of ChatGPT

Evaluation criteria	Manual translation (student)	Translated using ChatGPT
Accuracy of meaning	Overall, the main meaning is retained, though details and terminology may be inaccurate	High accuracy, precise rendering of nuances and terminology
Grammatical accuracy	Some mistakes may occur in the coordination and construction of complex structures	No grammatical mistakes, and the syntax is correct
Vocabulary	Basic words and expressions are used; there is sometimes a lack of variety	The vocabulary is varied, with synonyms chosen according to the context
Stylistic adequacy	The original structure is often retained, but the stylistic naturalness is not always maintained	The style is adapted to the conventions of the target language, and the text reads fluently and naturally
Coherence and cohesion	The overall structure remains the same, but there are some breaks in the flow between sentences	Strong coherence, fluent transitions and a logical structure
Cultural adaptation	A literal translation, without taking cultural contexts into account	Accurate adaptation of idioms, cultural references and cultural characteristics
Editorial workload	Needs significant revision	The minimum change amounts to a stylistic specification
Quality of the translation	The average level, reflecting the learner's skills	The professional standard required for editorial work

In the following section, the results of the pilot study aimed at assessing the impact of integrating AI tools on the quality of translation training for linguistics students would be discussed.

In the control group, teaching took place in a traditional format without the use of AI tools, while in the experimental group, ChatGPT and DeepSeek chatbots were

integrated for text analysis, term clarification and post-editing of translations. After completing the tasks, the quality of the translation was evaluated according to seven criteria: accuracy of meaning, grammatical correctness, lexical richness, stylistic appropriateness, coherence, cultural adaptation and editorial workload. Each criteria was evaluated on a 10-point scale. The results are presented in Table 2.

A 10-point scale was used for the quantitative assessment of translation quality, where 1 denoted the lowest quality and 10 the highest possible level of fulfilment of the criteria. Thus, the values ‘7.2’, ‘8.9’, ‘9.1’ and so on in the table represent arithmetic mean scores; each student completed a translation, after which their work was assessed against seven criteria; then all the marks for the group were summed up and divided by the number of students, which allowed us to obtain an average score for each criterion.

Table 2 presents the average translation quality scores, reflecting the level of development of specific translation skills among students in each group. The calculations were based not on the groups themselves, but on their average scores (M).

M_{EG} – average score of the experimental group

M_{CG} – average score of the control group

The “Dynamics (%)” indicator shows the relative increase in quality, calculated using the formula:

$$Growth = \frac{M_{EG} - M_{CG}}{M_{CG}} \times 100\%.$$

Table 2

An average translation quality score in the control group and the experimental group

Evaluation Criteria	Control Group (CG)	Experimental Group (EG)	Growth (%)
Accuracy of meaning	7.2	9.1	+26%
Grammatical accuracy	7.5	9.4	+25%
Vocabulary	6.8	8.9	+31%
Stylistic adequacy	6.9	9.0	+30%
Coherence and cohesion	7.0	9.2	+31%
Cultural adaptation	6.3	8.7	+38%
Editorial workload (inverse indicator - lower = higher quality)	6.1	9.3	+52%
Final average score	6.97	9.09	+30%

According to the results of the study, we have made the following conclusions. The research focused on evaluating the effectiveness of integrating AI-based chatbots into the translation training process for linguistics students has provided us with empirically validated data indicating an improvement in the quality of translation work when using AI tools. A comparison of the results of the control and experimental groups revealed consistent differences across all outcome measures: accuracy of meaning, grammatical accuracy, lexical and stylistic variety, cohesion, cultural adaptation, and the degree of editorial workload.

Conclusion

The results confirm that the research objective has been achieved: the inclusion of AI-powered chatbots in the educational process contributes to improving the effectiveness of translation training, optimising various stages of translation, and enhancing the quality of the final product. At the same time, it was found that the use of AI cannot be regarded as a substitute for professional practice: effectiveness is achieved only when automated support is combined with traditional teaching methods and the development of critical thinking.

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COMBINING ARTIFICIAL INTELLIGENCE (CHATGPT) AND A MOBILE MINI-CORPUS WITH THE LEXICAL APPROACH

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Abstract. This study examines students' perceptions of a digital lexical approach based on the use of artificial intelligence (ChatGPT) and a mobile mini-corpus. The research aims to evaluate students' engagement and the effectiveness of AI-assisted lexical tasks. The findings demonstrate a high level of motivation and interest, as well as certain difficulties related to prompt formulation and mobile interface limitations.

Keywords: lexical approach; artificial intelligence; ChatGPT; mobile learning; corpus linguistics.

ИСПОЛЬЗОВАНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА (CHATGPT) И МОБИЛЬНОГО МИНИ-КОРПУСА С ЛЕКСИЧЕСКИМ ПОДХОДОМ

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Аннотация. Статья посвящена анализу восприятия студентами цифровой лексической методики, основанной на использовании искусственного интеллекта (ChatGPT) и мобильного мини-корпуса. Рассматриваются особенности вовлечённости обучающихся и эффективность заданий. Результаты показывают высокий уровень мотивации, а также ряд трудностей, связанных с формулированием запросов и мобильным интерфейсом.

Ключевые слова: лексический подход; искусственный интеллект; ChatGPT; мобильное обучение; корпусная лингвистика.

Introduction

The development of digital educational environments encourages the integration of interactive technologies into linguistic training. The lexical approach, which focuses on the acquisition of multi-word units and lexical chunks, becomes especially

relevant in combination with corpus-based and AI-driven tools. According to Lewis, lexical chunks ensure fluency and naturalness of speech production [3, p. 34].

The emergence of artificial intelligence tools such as ChatGPT opens new opportunities for generating contextualized language input, providing instant feedback, and personalizing learning processes. At the same time, mobile-assisted language learning (MALL) emphasizes accessibility and flexibility but introduces certain technological constraints [2, p. 8].

The aim of this study is to investigate students' perceptions of AI-assisted lexical tasks and evaluate their impact on motivation and vocabulary acquisition.

Theoretical framework

The study is based on the lexical approach proposed by Lewis, which highlights the importance of acquiring lexical chunks for developing communicative competence. This approach is focused on the lexical units as the core of the language, taking a look at the grammar as a “lexicalized” system [3, p.28]. Corpus linguistics, as developed by Sinclair, emphasizes the analysis of authentic language data and frequency patterns, which allows for the creation of language corpora to assist in compilation of authentic material, which in turn allows for quality learning material [6, p. 114]. Schmitt argues that vocabulary acquisition requires repeated exposure in various contexts and the development of noticing skills [5, p. 69]. In this regard, ChatGPT can be considered a tool that facilitates repeated contextualization and supports noticing through interactive dialogue.

Additionally, the study relies on the principles of mobile-assisted language learning and AI-assisted learning, which promote continuous interaction with digital resources and learner autonomy [2, p. 11]. The flexibility, accessibility, and personalization of the educational process are highlighted by modern notions of mobile learning (MALL), which are made possible by the use of smartphones as the main learning tools. [2]. Russian researchers highlight the need to adapt the corpus and visualize data for the effective integration of digital technologies into classroom instruction [7. p. 89]. Meanwhile, AI is getting progressively popular with the population in general and language learners in particular. More students are coming to the understanding that such tools can improve their educational experiences as technology develops [1, p. 87]. Students now commonly see applied AI-powered study, AI-driven resources, or even attending AI-related classes and workshops as helpful means of expanding their knowledge and skills. Nowadays, many students are already aware of how it can improve their learning opportunities and growing student interest in AI is a sign of a broader movement to use new technology to improve education. AI technologies are increasingly being used in educational settings to provide personalized instruction, accelerate administrative processes, and enhance student learning. Some examples of their uses are:

Intelligent Tutoring Systems (ITS). These systems employ artificial intelligence (AI) to give students individualized instruction and feedback. They provide exercises, tips, and explanations that are specific to the learner's comprehension level. ALEKS and Carnegie Learning are two examples.

Platforms for Adaptive Learning. These platforms employ machine learning algorithms to modify the pace and content of instruction according to each student's performance. They monitor development and tailor the curriculum to each student's requirements. DreamBox and Knewton are two examples.

NLP, or natural language processing. NLP makes it possible for computers to comprehend, decipher, and react to human language. It is used in education for things like grading essays, giving written work feedback, and assisting with language acquisition. Examples include Duolingo and automated essay scoring systems.

Virtual assistants and chatbots. Chatbots and virtual assistants with AI capabilities give teachers and students immediate assistance and information. They can help with administrative duties, offer reminders, and respond to frequently asked questions. Examples include QuillBot, virtual assistants like IBM Watson, ChatGPT, and chatbot integrations in learning management systems (LMS) [1]

By increasing the efficiency, accessibility, and personalization of learning, these AI technologies are contributing to the revolution in education. They provide fresh approaches to student engagement, teacher assistance, and administrative process optimization [4, p. 140].

Adaptive educational systems create personalized learning materials based on the student's responses during the learning process. These materials are then used to shape the student's learning path.

MT software. The process of translating written or spoken texts from one natural language to another using computer software is called machine translation (MT). The quality of machine translation has significantly improved thanks to artificial intelligence technologies like neural machine translation, and millions of people use free web-based MT services like Google Translator, Translator Online, Foreign Word, and Web Translation for learning.

NLP and machine learning-based AI writing assistants guide users through different stages of the writing process.

Chatbots. They are arrays of computer programs designed to hold conversations and imitate human interaction. And while they can be used successfully in ELT, chatbots are most commonly used in business and marketing or even entertainment [4].

Methods and results

The experiment involved two groups of third-year linguistics students: an experimental group (14 students) and a control group (15 students). The experimental group used a digital lexical methodology incorporating ChatGPT and a mobile mini-corpus, while the control group followed a traditional approach.

The experimental procedure included pre-testing, a series of AI-assisted tasks, and post-testing. Students used ChatGPT to generate examples, paraphrase expressions, and analyze lexical patterns. They also worked with corpus tools such as SKELL and Linggle.

The results showed a high level of engagement: more than 70% of students reported that interaction with artificial intelligence improved vocabulary retention and increased motivation. ChatGPT enabled students to access diverse contextual examples and identify lexical patterns more effectively.

However, several challenges were identified. Students reported difficulties in formulating precise prompts and evaluating the reliability of generated responses. Mobile interface limitations, such as small screens and multitasking demands, also increased cognitive load.

Compared to the control group, the experimental group demonstrated higher motivation and described the learning process as more interactive and innovative. At the same time, both groups emphasized the importance of clear instructions and structured tasks.

Conclusion

The findings confirm the effectiveness of integrating the lexical approach, corpus tools, and artificial intelligence in language learning. Students show increased engagement and improved ability to identify lexical patterns. Furthermore, we can observe an increase in student motivation, as well as increased interest in studying as a whole. This solves numerous problems that teachers encounter in their classrooms.

However, the use of AI requires the development of prompt formulation skills and critical evaluation of generated content. The teacher must be aware of probable mistakes and imperfections, that will inevitably be encountered in the use of AI, more so throughout the longer periods of utilizing the AI due to accumulation of minor mistakes. Mobile limitations also need to be considered when designing tasks. The proposed methodology can be recommended for further implementation in multimodal language teaching and future research on AI-assisted learning.

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THE IMPACT OF ARTIFICIAL INTELLIGENCE TECHNOLOGY ON THE ORGANIZATION OF PEDAGOGICAL INTERACTION

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Abstract. This article investigates the impact of Artificial Intelligence on pedagogical interaction in the context of the digital transformation of the education system. Using a theoretical-analytical method, the main points of convergence between pedagogical interaction and intelligent systems are revealed.

Keywords. artificial intelligence; pedagogical interaction; digital technologies; educational process.

ВЛИЯНИЕ ТЕХНОЛОГИЙ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА НА ОРГАНИЗАЦИЮ ПЕДАГОГИЧЕСКОГО ВЗАИМОДЕЙСТВИЯ

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Аннотация. В статье рассматриваются влияние искусственного интеллекта на педагогическое взаимодействие в условиях цифрового перехода образовательной системы. На основе теоретико-аналитического

метода раскрываются основные точки соприкосновения педагогического взаимодействия и интеллектуальных систем.

Ключевые слова: искусственный интеллект; педагогическое взаимодействие; цифровые технологии; образовательный процесс.

Introduction

In the current educational system, there is a need to transform the forms and dynamics of pedagogical interactions in the context of the digital transition. The digital age in education, driven by rapid growth and development of artificial intelligence (AI) is having a transformative impact on the methods and forms of pedagogical interaction as a result of the integration of a new participant – an intelligent system – into the traditional model. The potential of digital technologies including AI, lies in their ability to optimize the educational process, make information accessible and tailor learning to students' needs [4]. During the period of digital transition, defining the boundaries of the use of AI tools will help to distribute responsibility for use and preserve the humanistic principles of education.

Even before the development of digital transformation in the education environment, Russian legislation began to revise the regulatory framework to control the use of AI. The legislative initiative which is called “National Strategy” focuses on the importance of creating standards for the use of neural networks [3]. At the international level UNESCO adopted the document “Recommendation of the Ethical Aspects of AI”. The adopted act focuses on the human ensuring the protection of his rights and dignity [9]. This article is based on the scientific works of such researchers as A. V. Smirnov, T. A. Tantsura, I. D. Frumin and others whose scientific interests are caused by the integration of neural networks into educational process.

According to the researchers, the intensive integration of AI into the educational process requires the development of both technical measures and the analysis of ethical aspects. Thus, authors note that the algorithmization of education emphasizes the limits of the permissible technological impact on teaching, having first established principles for regulating AI in education [7].

The object of the study is pedagogical interaction in a digital educational environment. The subject of the study is the transformation of pedagogical interaction under the introducing AI technologies into educational process. The goal of the study is to identify the impact of introducing AI technologies into pedagogical interaction.

Theoretical framework

The leading role in the education system is occupied by the pedagogical interaction, which acts as the basis for establishing trusting relationships and enhancing the development of all subjects of the educational process.

Azimov and Shukin define *pedagogical interaction* as a type of educational collaboration between a teacher and students, including verbal and non-verbal communication. This type of communication involves working together on academic tasks and projects, where the teacher organizes and directs the students [1]. As authors mention in their study, pedagogical communication is an important component of pedagogical interaction. The teacher has the opportunity to influence the cognitive processes of the learner and form certain models of behavior in them. Effective collaboration between teachers and students in the educational process takes the form of subject-subject relationships, within which it is necessary to follow the principles of equality of all participants and take into account the individual characteristics of each student [2; 8].

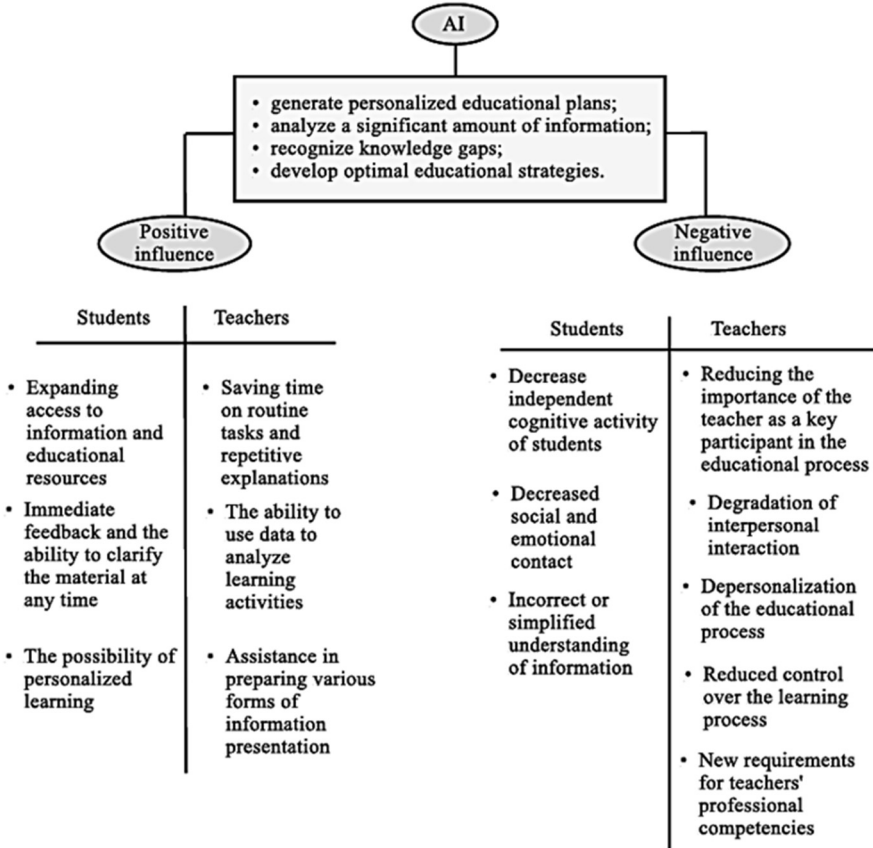
The transformation of the educational system towards digitalization leads to significant changes in the nature of pedagogical interaction. Distance learning systems, AI and immersive VR environments perform a key role in increasing communication flexibility, but at the same time, the level of its mediation increases. Modern research, conducted by M. E. Vaindorff-Sysoeva, indicates that digitalization has a transformative effect on the system and pace of pedagogical interaction. According to the analysis, the digital educational environment is a fundamentally new model for organizing the educational process. This transformation requires a reevaluation of the role of the subjects of the educational process and a change in communication forms [10].

AI is integrated into the education system as an innovative element capable of replacing a number of functions that were traditionally considered the competence of a teacher. Modern educational platforms integrate AI as virtual teaching assistant to facilitate continuous exchange, explain learning materials and provide immediate feedback. [10] Its use changes the pedagogical interaction, acting as a mediator between the teacher and the student, influencing the dynamic and frequency of the dialogue between them.

N. Selwyn and M. Sharples's scientific researches highlight the duality of AI in pedagogical interaction. [5, 6] AI tools expand the possibilities of the educational process, but at the same time they increase changes in the communicative structure of the educational process. The main threats are the decline in personal interaction, the depersonalization of learning and the reduction of the importance of the teacher as a source of knowledge. The problem lies in preventing technology to displace pedagogical interaction from the educational process (see Pic. 1).

The presented scheme shows that the use of AI requires the revision of existing pedagogical approaches and the principles of organizing pedagogical interaction, since digital technologies expand access to information and reduce the workload of teaching staff, but also reduce the quality of interpersonal communication and the dissemination of unreliable data.

AI in educational process



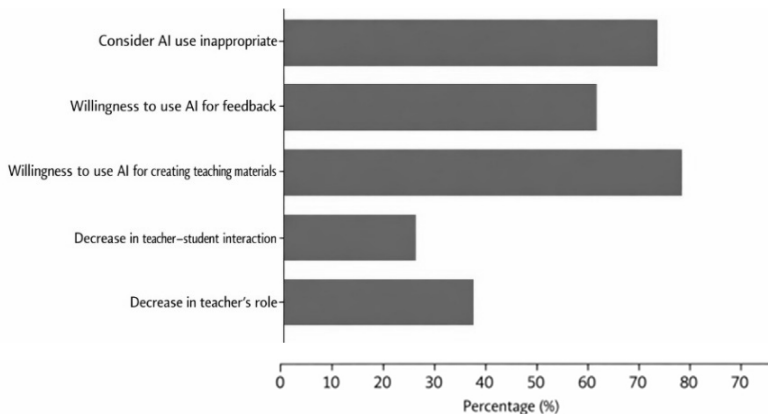
Pic. 1. The functions of AI and its impact on pedagogical interaction

Methods and results

Based on the research results we conducted a survey among 1st – 4th year students and teachers at Novosibirsk State Technical University. This survey includes a list of closed-ended questions aimed at identifying the frequency of AI use and associated changes in pedagogical interaction. This study involved 89 respondents, 15 of whom were teaching staff and 74 students.

The survey results showed that AI is used by students to analyze theoretical materials, clarify assignments and prepare for exams. According to students, AI helps

to quickly obtain the necessary information and basic knowledge on a topic. This reduces the amount of personal interaction with the teacher. But at the same time, inaccuracies in the proposed answers of AI encourage students to ask for support from the teacher to fully understand the educational material. Teachers express criticism of the integration of neural networks into the educational process. For a detailed understanding of the results, a diagram was created to present data on the implementation of AI in the educational process (see Pic. 2).



Pic. 2. Teachers' attitudes toward the use of AI in the educational process

The presented data show that the attitude of teaching staff towards the use of AI technologies is contradictory. While there is a significant readiness to use AI in preparation for lessons, the majority of respondents note the risk of a decrease in the role of the teacher and a weakening of pedagogical interaction. The data obtained demonstrate the transformation in the nature of pedagogical interaction, which leads to a decrease in live communication.

Conclusion

Summarizing all of the above, digital transformation in the field of education directly affects the formats of pedagogical interaction, but does not replace the teacher. Digital tools expand the possibilities of the educational process, providing access to a large amount of information in a short time, at the same time increasing the independence of students, which leads to less frequent and fragmented interaction with teacher. The conducted research has established that AI technologies modify the structure of pedagogical interaction, putting forward new requirements for the format of interaction between teacher and student.

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PERSONALIZATION OF AUTHENTIC VIDEO CONTENT: ARTIFICIAL INTELLIGENCE AS A TOOL FOR ADAPTING ENTERTAINING MATERIALS TO DEVELOP LISTENING SKILLS

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Abstract. The article is devoted to the problem of developing listening skills among second-year linguistics students when working with authentic video content. Based on the analysis of modern research, the potential of artificial intelligence for the personalization of entertainment videos is demonstrated: automatic generation of multi-level subtitles, interactive exercises and adaptive learning trajectories.

Keywords: artificial intelligence; personalization; authentic video content; listening skills; educational technologies.

ПЕРСОНАЛИЗАЦИЯ АУТЕНТИЧНОГО ВИДЕОКОНТЕНТА: ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАК ИНСТРУМЕНТ АДАПТАЦИИ РАЗВЛЕКАТЕЛЬНЫХ МАТЕРИАЛОВ ДЛЯ РАЗВИТИЯ НАВЫКОВ АУДИРОВАНИЯ

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Аннотация. Статья посвящена проблеме развития навыков аудирования у студентов лингвистов второго курса при работе с аутентичным видеоконтентом. На основе анализа современных исследований обосновывается потенциал искусственного интеллекта для персонализации развлекательных видеоматериалов: автоматическая генерация разноуровневых субтитров, интерактивные упражнения и адаптивные траектории обучения.

Ключевые слова: искусственный интеллект; персонализация; аутентичный видеоконтент; навыки аудирования; образовательные технологии.

Introduction

In the context of digitalization of higher linguistic education, the development of receptive skills, particularly listening, remains one of the most difficult tasks.

Second-year Linguistics students studying French as a second foreign language frequently encounter barriers when perceiving authentic oral speech: fast pace, regional accents, lack of visual support and individual differences in proficiency level. Traditional teaching materials offer ready-made dialogues and exercises, but they do not always reflect real communication and do not consider the personal needs of students [1].

Modern research demonstrates that authentic video content is significantly more effective than artificially created texts for developing listening skills, as it provides natural language input and increases motivation. Nevertheless, without adaptation such content often exceeds students' zone of proximal development, causing frustration.

Artificial intelligence acts as a key personalization tool: it enables automatic speech transcription, generation of multi-level subtitles, creation of interactive exercises in real time, and analysis of individual errors [2; 3]. The aim of the article is to confirm the effectiveness of AI for adapting entertainment videos in developing listening skills among future linguists based on an experimental lesson. Objectives: to analyze the theoretical foundations, describe the experimental methodology, present quantitative and qualitative results, and formulate practical recommendations. The novelty of the research lies in the concrete integration of AI tools into the lesson on «Les itinéraires» based on real classroom environment.

Theoretical framework

The theoretical foundation of the study rests on key principles of second language acquisition. According to Krashen's Input Hypothesis, effective language acquisition occurs when learners receive comprehensible input that is slightly above their current level [4]. Authentic video perfectly meets this requirement but often causes foreign language anxiety if it is not adapted to the student's level. Modern research shows that AI personalization not only improves comprehension but also significantly reduces anxiety by providing multi-level support and immediate feedback [2; 3; 5].

Modern research confirms the advantages of AI in personalizing video content. AI platforms enable the generation of multi-level subtitles and individual exercises, increasing listening comprehension by 20–35 % [2]. AI-driven speech recognition has demonstrated a significant improvement in listening skills [3]. Similar conclusions are presented in other works [5; 6].

In Russian methodology the emphasis is traditionally placed on communicative exercises, yet the integration of AI into authentic video work remains insufficiently explored [1; 7; 8].

Thus, existing research demonstrates the hypothesis that personalization of authentic video using AI increases the effectiveness of listening development by individualizing input, reducing anxiety, and increasing motivation.

Methods and results

The experiment was conducted in a practical lesson on French as a second foreign language for second-year students of the Linguistics department. The topic of the lesson fully corresponded to the work program and the textbook by E. S. Fefelova [1]. The following materials and tools were used in this lesson: authentic video «French for beginners: asking and giving directions», a worksheet with exercises (including segmented viewing of the video, dialogue completion, associations, role-playing, and the creative assignment «Du Louvre à la gare de Lyon»), presentation (dialogues, vocabulary, Wordwall game) and AI tools: automatic speech recognition and subtitle generation (based on Whisper-like models), interactive exercises created in real time, and error analysis via Google Forms with subsequent AI processing (ChatGPT-4o was used to automatically classify mistakes and generate individual feedback).

Measuring results:

Pre-test: understanding videos without adaptation (42% of correct answers in Exercise 1).

Post-test: after AI-adapted viewing and exercises (70%).

Qualitative analysis of students' spoken dialogues and creative written tasks (Exercise 4-5).

Feedback form (motivation, usefulness of adaptation).

Quantitative results (see Table 1):

Table 1

Indicator	Before adaptation	After adaptation	Growth
Understanding oral speech (exercise 1)	42 %	70 %	+28 %
Use of vocabulary in a role-playing game (≥5 expressions)	65 %	95 %	+30 %
Performing a creative task (≥6 expressions)	70 %	90 %	+20 %

Student papers demonstrate the proper use of the word combinations: «prenez la prochaine rue à droite», «traversez la rue», «au bout de la rue», «juste à côté de». 100 % of participants reported high motivation and reduced foreign language anxiety thanks to the adapted subtitles and immediate AI feedback. The errors in Exercise 1 before the adaptation caused by the speed of speech and unfamiliar expressions; after that, they practically disappeared. The analysis shows that AI adaptation allowed students to be in the zone of immediate development, which corresponds to the theoretical provisions and explains the recorded growth.

Conclusion

The experiment proved the effectiveness of artificial intelligence as a tool for personalizing authentic video content in the development of listening skills among second-year Linguistics students. Adaptation using Whisper AI and ChatGPT-4o led to significant improvement in comprehension, proper use of lexical phrases, and reduced foreign language anxiety. The adaptation of the entertaining video on the topic «Les itinéraires» led to a considerable improvement in results, increased motivation and practical vocabulary acquisition. The data obtained confirm the hypothesis of the study and can be used in the practice of teaching a second foreign language, in the development of digital educational resources and in the further scaling of the experiment.

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OVERCOMING DIFFICULTIES IN LEARNING HIEROGLYPHICS BY REGIONAL STUDENTS USING AI TECHNOLOGIES

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Abstract. This article examines the piloting of a method for teaching Japanese language and kanji to first-year students majoring in regional studies using artificial intelligence tools. This technology was used to generate assignments and contextual examples from authentic sources, automate the teacher's work, and organize student work. The pilot results confirm the rapid acquisition of kanji, as well as increased effectiveness of students' independent work.

Keywords: Artificial intelligence; Japanese characters; kanji; regional studies students; digital transformation of education.

ПРЕОДОЛЕНИЕ ТРУДНОСТЕЙ УСВОЕНИЯ ИЕРОГЛИФИКИ СТУДЕНТАМИ-РЕГИОНОВЕДАМИ С ИСПОЛЬЗОВАНИЕМ ТЕХНОЛОГИЙ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

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Аннотация. В статье рассматривается апробация методики обучения японскому языку и иероглифике студентов-регионоведов первого курса с использованием инструментов искусственного интеллекта. Данная технология применялась для генерации заданий и контекстных примеров из аутентичных источников, автоматизации работы преподавателя и организации работы студентов. Результаты апробации подтверждают скорость усвоения иероглифики, а также рост эффективности самостоятельной работы студентов.

Ключевые слова: искусственный интеллект; японская иероглифика; кандзи; студенты-регионоведы; цифровая трансформация образования.

Introduction

The current stage of higher education development is characterized by the active integration of AI technologies into the educational process. They are a key factor in the transformation of educational practice. This poses new challenges in

developing kanji competence for students majoring in regional studies and studying the Japanese region. Mastering the skill of writing kanji is not just an academic requirement, but an introductory specialized skill and a model for working with authentic sources, analyzing Japanese media, and studying official documents and scientific literature. However, traditional methods of teaching kanji, developed in the pre-digital era and based solely on mechanical notation and memorization, are increasingly demonstrating their limitations in the face of time constraints and the need for personalized educational programs.

Theoretical framework

Mino Amari's article examines the integration of artificial intelligence technologies into Robert Gagné's "twelve learning events" model. It also analyzes the practical challenges of implementing such a model in the education system and suggests ways to overcome them [1]. Kobori Michiyo's article explores the use of generative AI, such as ChatGPT, Gemini, and others, in working with international students learning Japanese for employment in the tourism industry. The author notes that these technologies facilitate the solution of individual student learning problems and demonstrates that collaborative discussion of AI results stimulates group work and knowledge sharing among students [2]. Yu. A. Keva and D. E. Koneva's article examines the use of training set synthesis methods, as well as machine and deep learning techniques, for recognizing Japanese characters. Although the article itself was written in the context of developing a character recognition app, it also has educational value for students who may use similar AI-based apps to memorize characters [3].

Methods and results

The online resources Quizlet, WordWall, and OnlineTestPad were used during the pilot testing. The tasks were generated using AI tools such as MistralAI and DeepSeek. The tasks for memorizing and learning kanji were based on textbooks such as *Minna no Nihongo* (The Book of Japanese) and *Foreign Language of the Region of Specialization: Japanese*, authored by S.S. Kolyshkina and O.V. Moskvina, instructors from the Department of International Relations and Regional Studies at NSTU. A group of first-year Japanese regional studies students was tested. An analysis of four assessments administered to the group revealed a consistent positive trend in academic performance, which is directly related to the change in the class format and knowledge assessment.

The first assessment was conducted in person using the classical methodology and focused on kanji. The results were predictably low for the entrance exam: the average score was only 3.08, the quality of knowledge (the percentage of grades "4" and "5") was at 23%, and the academic performance (no "2" grades) barely reached 69%. A worrying sign was the fact that almost a third of the group (30.8%) received

unsatisfactory grades, indicating the complexity of the material and possible gaps in the students' basic preparation under traditional delivery.

Starting with the second assignment, the teaching and assessment format was changed: assignments were created using artificial intelligence technologies, and the assignments themselves were conducted remotely. The second assignment showed a small but significant improvement: the average score rose to 3.19, the quality of knowledge increased to 31%, and the percentage of students failing the exam decreased to 25%. Students began to adapt to the new format, and the material itself became more accessible and structured thanks to the capabilities of AI.

The third assignment (remote, using AI) marked a real breakthrough. The average grade soared to 3.88, and the quality of knowledge reached a record 75%. Even though the overall performance dropped to 87.5% due to one failing grade, it became clear that the remote format, coupled with AI, allows the motivated group to realize their potential far more effectively than traditional classroom teaching.

The fourth study finally cemented the success of the new approach: the average grade remained at a high 3.89, the overall performance reached 100% (with no failing grades), and the quality of knowledge reached 55.6%. The slight decrease in the quality percentage compared to the third study is explained by the increased number of students writing, but the very fact of conducting classes remotely raises concerns about dishonest assignment completion, including the use of AI to help students complete the assignments themselves.

Conclusion

A pilot study of using artificial intelligence technologies in teaching Japanese kanji to regional studies students confirmed the effectiveness of the proposed approach: the results of four assessments demonstrated consistent positive dynamics (the average score increased from 3.08 to 3.89, the quality of knowledge increased from 23% to 55.6%, and the academic performance reached 100%). The use of AI (MistralAI, DeepSeek) expanded educational opportunities by generating a variety of assignment types (matching, filling in the blanks, grouping by keys, contextual texts) and created conditions for personalized learning. This contributed not only to the improved academic performance of motivated students (up to 75% of the quality of knowledge in the third assessment) but also to the reduction of barriers for underachievers (a complete absence of failing grades in the final assessment). The obtained results confirm the feasibility of further integrating AI into the development of kanji competence and its scaling to other aspects of regional studies language training.

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CONDITIONS FOR ORGANIZING INDEPENDENT WORK OF FUTURE TEACHERS USING ARTIFICIAL INTELLIGENCE TECHNOLOGIES

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Abstract. This article presents the results of a study examining the conditions necessary for the effective organization of independent work for future teachers. It is shown that the use of digital resources in organizing postgraduate students' independent work increases its effectiveness, promotes the development of information management skills, and promotes self-education skills.

Keywords: Independent work; digitalization of education; artificial intelligence, academic writing, future teachers.

УСЛОВИЯ ОРГАНИЗАЦИИ САМОСТОЯТЕЛЬНОЙ РАБОТЫ БУДУЩИХ ПЕДАГОГОВ С ИСПОЛЬЗОВАНИЕМ ТЕХНОЛОГИЙ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

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Аннотация. В статье представлены результаты исследования условий, необходимых для эффективной организации самостоятельной работы будущих педагогов. Показано, что применение в организации самостоятельной работы аспирантов цифровых ресурсов повышает её эффективность, способствует совершенствованию навыков работы с информацией, а также навыков самообразования.

Ключевые слова: самостоятельная работа; цифровизация образования; искусственный интеллект, академическое письмо, будущие педагоги.

Introduction

The current dynamic of improving the methodology and content of professional teacher training in postgraduate programs requires an understanding of new methods and approaches to developing the professional identity of future higher education teachers. In modern society, there is a growing need for specialists capable of working effectively in higher education, not only delivering educational activities but also embracing a culture of continuous self-education, self-organization, and self-improvement.

The purpose of this study is to theoretically substantiate the conditions for effectively organizing independent work in teaching postgraduate students foreign language academic writing at a university using artificial intelligence technologies.

Theoretical framework

One of the key conditions for organizing the independent work of future teachers is the digitalization of learning. For postgraduate students, the learning process in a digitalized environment provides the opportunity to autonomously manage their educational journey, receive educational content adapted to changing needs throughout the educational program, and receive personalized feedback, flexibly meeting individual educational needs [2]. In a digital environment, postgraduate students develop self-educational subjectivity, which includes a set of personal qualities that contribute to the formation of identity, an independent search for meaning and value in knowledge, goal and objective setting, as well as self-analysis and reflection. These qualities determine the postgraduate student's position on

learning as a process they manage and organize, constructing and implementing their own development plans.

Digital technologies open new horizons for the self-educational process and provide postgraduate students with unique opportunities for their academic and professional success [3]. Developing postgraduate students' digital competencies and skills is crucial for the long-term development of academic opportunities, sustainable development, and meeting professional requirements [6]. The use of digital technologies provides the opportunity to study at any time and in any place via the Internet, mobile devices and other means without restrictions in time and space, stimulates the interest of postgraduates in learning and innovative thinking, develops the ability for independent learning and acquisition of practical skills [7].

The second condition for the effective organization of independent work and the successful development of professional self-awareness in postgraduate students majoring in pedagogy is the development of methodological recommendations aimed at developing skills for independent knowledge acquisition, setting value-oriented goals, identifying and further developing creative potential, and increasing interest in obtaining objective information within the discipline being studied [5].

Support received in various forms from the instructor has a significant impact on the degree of satisfaction with learning and the development of independence skills. Through mentoring, students gain confidence in their ability to take responsibility for their own learning, solve complex problems, and communicate in the professional community, which are essential skills for lifelong learning [8].

Methods and results

The study was conducted at Novosibirsk State Technical University from April to May 2025. Ten graduate students in the Faculty of Humanities participated in the study. Digital AI technologies were integrated into their independent work while studying the course "Foreign Language for Academic Purposes." A questionnaire we developed was used for the preliminary analysis. It included questions about students' understanding of the concept of professional identity, the need to study foreign language academic writing in graduate school, and the relevance of using digital technologies in the learning process. An algorithmic map served as the primary tool for organizing the independent work, allowing the students to navigate the sequence and specific features of working with digital resources during their studies. The final reflective questionnaire included questions about their subjective assessment of the effectiveness of using digital technologies and AI tools.

The most effective means of developing the self-awareness of future university teachers is the proper organization of independent work. The following conditions will facilitate a productive solution to this problem: defining practice-oriented tasks, providing pedagogical support, and developing a need for independent cognitive

activity [1]. In the context of mastering the course "Foreign Language for Academic Purposes," these conditions were implemented through the use of modern digital technologies. In the context of blended learning, digital resources are integrated into various formats of the educational process as part of independent work, organized according to the "flipped classroom" principle. In-person discussions of completed work do not occur immediately, but rather after a detailed independent study of the topic and the completion of practical assignments [4]. An experimental study was conducted among first-year postgraduate students majoring in Methodology and Technology of Professional Education within the framework of the "Foreign Language for Academic Purposes" course. This study examined the impact of using neural network technologies on the development of foreign language academic writing skills.

The first (introductory) stage focused on developing the cognitive needs of future teachers to enrich their knowledge. To determine the level of digital competencies and basic cognitive skills, a survey was conducted, encouraging respondents to reflect on their subjective assessment of their abilities, knowledge, skills, and abilities, as well as personal qualities essential for success in mastering the discipline. This allowed us to determine the level of graduate students' readiness to use AI technologies during independent work. Initially, we assessed their ability to independently define educational goals and objectives, as well as current and future work directions during the course. We also provided an introduction to the structure and content of the educational materials and the planned outcomes of mastering the discipline.

In the second (activity-based) stage, graduate students planned their independent work in accordance with their individual learning needs (including language proficiency, speed of perception and processing of information, etc.). Developing a plan involved studying new material, systematizing it, and considering its practical application. To coordinate this process, we developed an algorithmic map, which included instructional, explanatory, organizational, and monitoring materials for all stages of independent work.

The process of independent work with foreign-language academic texts was organized using the online AI-resources, which offers a workflow that encourages graduate students to actively engage with text outside of class. The algorithmic map, provided to the graduate students by the instructor, described the following work stages and practical tasks for using AI-resources.

Thus, the learning outcome is an increase in the professional self-awareness of future teachers while developing their foreign language academic writing skills. Organizing independent work using modern digital technologies and tools fosters interest and motivation in the subject being studied, develops self-study skills, and fosters readiness for independent practical application of this knowledge and skills in professional activities.

Conclusion

Organizing independent work using digital technologies allows students to refine their skills in interacting with various information management tools and, thereby, develop the digital competencies needed by future teachers in their professional work. Providing instructors with methodological recommendations for working with digital educational resources is a prerequisite for the successful independent work of graduate students.

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ARTIFICIAL INTELLIGENCE AS A TOOL FOR DEVELOPING THE SOCIO-CULTURAL COMPETENCE OF LINGUISTIC STUDENTS STUDYING ENGLISH

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Abstract. This paper examines the role of artificial intelligence (AI) tools in developing sociocultural competence among linguistics students learning English. Drawing on communicative competence theory and data from a pedagogical experiment involving professional business correspondence, the paper discusses the advantages and limitations of AI-assisted language learning. The findings suggest that AI, when employed critically, can serve as a meaningful complement to traditional approaches to sociocultural education in EFL contexts.

Keywords: sociocultural competence; artificial intelligence; ELT; business correspondence; register; communicative norms.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАК ИНСТРУМЕНТ ФОРМИРОВАНИЯ СОЦИОКУЛЬТУРНОЙ КОМПЕТЕНЦИИ СТУДЕНТОВ-ЛИНГВИСТОВ, ИЗУЧАЮЩИХ АНГЛИЙСКИЙ ЯЗЫК

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Аннотация. В данной статье рассматривается роль инструментов искусственного интеллекта в процессе формирования социокультурной компетенции студентов-лингвистов и обсуждаются преимущества и ограничения изучения языка с использованием искусственного интеллекта. Полученные результаты свидетельствуют о том, что искусственный интеллект при критическом использовании может служить существенным дополнением к традиционным подходам к социокультурному образованию в контексте изучения английского языка как иностранного.

Ключевые слова: социокультурная компетенция; искусственный интеллект; деловая переписка, коммуникативные нормы.

Introduction

The widespread use of artificial intelligence-based tools in higher education has created new opportunities and new challenges for teaching foreign languages. Large language models, automated text assistants and intelligent feedback systems are now available to students as usual, which raises important questions about their impact on the development of communicative competence and, in particular, socio-cultural competence [1, p. 7; 4, p. 286)].

Theoretical framework

Sociocultural competence, understood as a student's ability to reproduce and interpret a language appropriate to a cultural context, is one of the most difficult aspects of learning a second language [2, p. 10]. Unlike grammatical precision, it cannot be reduced to a set of transparent rules; it is determined by social roles, institutional norms, genre conventions, and culturally specific expectations of the interlocutors [3, p. 4]. It is this complexity that makes artificial intelligence both a potentially valuable and potentially problematic resource in language classrooms.

The purpose of the present study is to investigate whether and how AI tools can support the development of sociocultural competence in the context of professionally oriented written English communication. Specifically, the study seeks to determine the extent to which AI-generated feedback prompts students to revise their texts in the direction of greater register appropriateness, adherence to genre conventions, and cultural sensitivity, and whether engagement with such feedback stimulates meaningful metalinguistic reflection.

Methods and results

The study employed a mixed-methods design combining quantitative assessment of student writing with qualitative analysis of classroom discussion. Participants were 15 second-year linguistics students ($n = 15$). The group consisted of students with an assessed English proficiency level of B2 (CEFR), all of whom had prior exposure to professional English but limited experience with formal business correspondence in the target language.

The main instruments of the study were: 1) a set of professionally designed business correspondence scenarios; 2) structured guiding questions directing students' attention to the sociocultural dimensions of each task; 3) AI-generated feedback obtained by students independently using AI tools; and 4) semi-structured classroom discussion as a qualitative data source. Student letters were assessed by the course instructor against a rubric comprising six criteria: appropriate register, correct use of epistolary formulae, tone toward the addressee, use of hedging and politeness strategies, culturally appropriate information sequencing, and critical engagement with AI feedback. Each criterion was evaluated in the initial draft

(prior to AI consultation) and in the revised draft (following AI consultation and reflection), enabling a direct before-and-after comparison.

AI tools offer several meaningful advantages in the context of sociocultural language learning. The most immediate is accessibility: students can obtain detailed, on-demand feedback on the tone, register, and genre conventions of their written texts without waiting for a teacher's response or navigating the social pressure that may accompany peer review. This is particularly valuable in professional and institutional genres, such as formal letters and business correspondence where sociocultural norms are especially codified [5, p. 115].

The second advantage is interactivity. AI enables students to produce multiple drafts, compare feedback across versions, and experiment with how changes in lexical choice or syntactic structure alter the social meaning of a text. This iterative process supports reflective, hypothesis-testing engagement with language that underpins deep learning.

Most significantly for sociocultural development, AI can function as a stimulus for metalinguistic reflection. When feedback identifies a phrasing as insufficiently formal or culturally inappropriate, the student is invited not merely to correct the text, but to examine the underlying norms at stake. Used in this way, AI becomes a tool for developing critical cultural awareness rather than simply surface-level correctness.

Despite these advantages, AI-assisted sociocultural learning carries notable risks. A primary concern is cultural bias: large language models are trained predominantly on texts reflecting Anglo-American norms, which may be presented to students as universal standards of appropriateness. These risks narrowing, rather than expanding, students' cultural awareness, particularly for those who will use English in *lingua franca* contexts with their own communicative conventions.

AI systems are also limited in their ability to account for relational and situational contexts. Sociocultural appropriateness depends on the specific identities and relationship of the interlocutors, the institutional setting, and the communicative purpose or variables that an AI system can process only to the extent that the user provides them explicitly. Feedback that is accurate at the level of general register may miss the fine-grained contextual judgments that mark genuine sociocultural fluency.

Finally, there is a risk of over-reliance. If students treat AI feedback as authoritative rather than as one perspective among several, they may develop an externalized, performative competence that does not become truly integrated into their communicative repertoire. The boundary between using AI as a feedback tool and using it as a ghostwriter also raises legitimate concerns about academic integrity and authentic learning.

During the preceding semester, a pedagogical experiment was conducted within a course on sociocultural competence in English. Students were asked to compose

professional business letters in response to a series of prepared scenarios simulating realistic communicative situations. Some scenarios involved writing to a university professor, for instance, requesting a rescheduling of an examination due to unforeseen personal circumstances; others involved correspondence with a current or prospective employer on professional matters. Each scenario was accompanied by guiding questions directing students' attention to the key sociocultural dimensions of the task: the relationship between writer and addressee, the appropriate level of formality, the genre conventions of professional correspondence, and the cultural norms governing politeness, directness, and institutional deference in English.

The letter requesting an exam rescheduling proved particularly instructive as a site of sociocultural negotiation. Students were required to balance a deferential stance toward institutional authority with the practical necessity of making a clear and specific request; to provide sufficient contextual explanation without oversharing personal information; and to frame their request in a way that acknowledged the professor's discretion while still communicating their need effectively. Decisions about salutation, closing formulae, hedging language, and the sequencing of information all carried sociocultural weight.

Following the initial drafting phase, students were encouraged to submit their letters to AI tools, specifically, large language model systems, and to request feedback on tone, register, and sociocultural appropriateness. This was structured as a reflective rather than a corrective exercise: students were asked to compare AI feedback with their own prior assessment, to evaluate whether the AI's observations were convincing and applicable to their specific scenario, and to bring their revised texts and written reflections to class for discussion.

The outcomes were instructive in both directions. In a number of cases, AI feedback drew students' attention to features they had not independently identified as problematic: the use of informal contractions in a formally addressed letter or the deployment of a direct imperative where a hedged formulation would be more appropriate given the power differential. In other instances, students found that AI feedback was too generic to capture the specific nuances of the scenario, or that it encoded Anglo-American norms not obviously applicable to their context. These discrepancies proved pedagogically productive, generating substantive classroom discussion about the cultural specificity of communicative norms and the limits of automated feedback as a guide to sociocultural competence.

The results of the experiment are summarized in the Table. Scores reflect the proportion of students whose letters met each criterion satisfactorily, as assessed by the course instructor, before and after AI consultation.

As the data indicate, the most substantial gains were observed in criteria directly related to interpersonal and institutional register: appropriate tone toward the addressee (47% → 80%), use of hedging and politeness strategies (40% → 73%),

and correct use of epistolary formulae (53% → 87%). Students were already comparatively strong in information sequencing, suggesting that this dimension of sociocultural competence was less dependent on AI feedback and more amenable to explicit instruction. Notably, the criterion of critical reflection on AI feedback assessed qualitatively during class discussion revealed that the students who engaged most actively in questioning and contextualising the AI's suggestions also demonstrated the deepest overall sociocultural understanding in their revised texts, a finding that underscores the importance of embedding AI tools within a pedagogically structured reflective framework.

Table 1

Results of the Business Correspondence Experiment (n = 15)

Evaluation criterion	Before AI feedback (initial draft)	After AI feedback (revised draft)	Observations
Appropriate register (formal / semi-formal)	9 / 15 students (60%)	14 / 15 students (93%)	Marked improvement; one student retained overly casual tone despite feedback
Correct use of epistolary formulae (salutation, closing)	8 / 15 (53%)	13 / 15 (87%)	Several students initially omitted conventional closing phrases
Appropriate tone toward addressee	7 / 15 (47%)	12 / 15 (80%)	AI feedback drew attention to unintentionally demanding phrasing
Politeness strategies	6 / 15 (40%)	11 / 15 (73%)	Use of direct imperatives replaced with modal constructions
Culturally appropriate information sequencing	10 / 15 (67%)	13 / 15 (87%)	Students generally strong in this area; AI confirmed existing choices

Conclusion

The evidence from this experiment suggests that AI tools have a genuine but circumscribed role in the development of sociocultural competence. They are most productive when they function as catalysts for reflection rather than as authorities on correctness, when they make visible the choices that a proficient communicator makes implicitly, and invite students to interrogate the cultural assumptions behind

them. Used in this way, AI can extend the range of feedback available to students, support iterative practice, and stimulate the kind of critical cultural awareness that sociocultural competence ultimately requires.

Used uncritically, however, AI risks flattening cultural complexity, fostering dependence, and importing culturally specific norms under the guise of universal standards. The pedagogical challenge, then, is not primarily technological but didactic: to design tasks and instructional frameworks that harness the affordances of AI while ensuring that students remain active, reflective, and critical agents in their own development. The business correspondence task described here represents one such framework, and the classroom discussions it generated suggest that, when properly scaffolded, the encounter between students' sociocultural judgments and AI feedback can be among the most productive moments in the language course.

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ARTIFICIAL INTELLIGENCE AS A TOOL FOR TRANSFORMING STUDENT SELF-GOVERNANCE IN RUSSIAN UNIVERSITIES

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Abstract. This paper explores the potential of artificial intelligence tools for transforming student self-governance in Russian universities. Based on a sociological study conducted at Tyumen Industrial University, the research identifies key challenges facing student self-governance and proposes AI-driven solutions to address them.

Keywords: artificial intelligence; student self-governance; digital transformation; university; student engagement.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАК ИНСТРУМЕНТ ТРАНСФОРМАЦИИ СТУДЕНЧЕСКОГО САМОУПРАВЛЕНИЯ

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Аннотация. Рассматриваются возможности применения инструментов искусственного интеллекта для трансформации студенческого самоуправления в российских университетах. На основе социологического исследования в Тюменском индустриальном университете выявлены ключевые проблемы ССУ и предложены ИИ-решения для их преодоления.

Ключевые слова: искусственный интеллект; студенческое самоуправление; цифровая трансформация; университет; вовлечение студентов.

Introduction

Student self-governance (SSG) has long been recognized as an essential component of university life, contributing to the development of leadership, communication, and organizational skills among students [1]. In Russia, the Federal Law on Education enshrines the right of students to participate in the governance of educational institutions [2]. However, empirical research consistently reveals a significant gap between the declared importance of SSG and its actual effectiveness [3].

The rapid development of artificial intelligence (AI) technologies opens new possibilities for addressing persistent challenges in student self-governance. While

AI applications in education have been extensively studied in the context of learning analytics and personalized instruction [4], their potential for transforming organizational aspects of student life remains underexplored.

This paper aims to identify the key problems of SSG in a Russian technical university and to propose AI-driven solutions for overcoming them. The study draws on sociological data collected at Tyumen Industrial University (TIU), one of the largest engineering universities in the Ural Federal District.

Theoretical framework

The theoretical foundation of this study combines the sociology of everyday life approach developed by Zh.T. Toshchenko [5], which emphasizes the analysis of real practices rather than formal declarations, with the human capital theory of G. Becker [6], which frames education and skills development as investments with measurable returns. Within this framework, SSG is conceptualized as a practical training ground where students accumulate both human and social capital through experiential learning.

The concept of digital transformation in higher education provides the second theoretical pillar. Following the classification proposed by Selwyn [7], AI applications in education can be analyzed across three dimensions: administrative (automation of routine processes), pedagogical (enhancement of learning outcomes), and social (transformation of communication and community building). This study focuses primarily on the administrative and social dimensions as applied to SSG.

Methods and results

The empirical research was conducted at TIU in 2025–2026 using a mixed-methods design. The quantitative component included a survey of general students ($n = 160$) and active SSG participants ($n = 45$). The qualitative component comprised 20 semi-structured expert interviews with university administrators, current and former SSG leaders, and regular activists.

The analysis revealed three critical problems that AI tools could address:

1. Information vacuum. 53% of surveyed students were unaware of SSG activities. This communication failure directly correlates with low engagement: among informed students, willingness to participate reaches 84%, compared to 72% in the general sample. AI-powered recommendation systems and intelligent chatbots could provide personalized information about SSG activities based on student interests, academic program, and behavioral patterns [8]. Natural language processing algorithms could analyze student feedback across social media platforms to identify emerging concerns and opportunities for SSG intervention.

2. Loss of intergenerational continuity. The COVID-19 pandemic (2020–2021) disrupted informal knowledge transfer between SSG generations. Expert interviews

confirmed that organizational memory, including negotiation strategies, project management practices, and administrative contacts, was largely transmitted through face-to-face mentoring. AI-based knowledge management systems could preserve and systematize this institutional knowledge, creating searchable databases of best practices, decision-making templates, and organizational workflows [9]. Generative AI could assist new leaders in drafting proposals, reports, and communications based on successful precedents.

3. Formalism and limited impact assessment. 62% of activists identified student passivity as the primary challenge, while 27% pointed to unclear mandates. AI analytics tools could enable evidence-based governance by tracking engagement metrics, measuring the impact of SSG initiatives on student satisfaction and retention, and generating data-driven recommendations for resource allocation. Predictive models could identify students at risk of disengagement and suggest targeted outreach strategies [10].

Additionally, the study identified promising AI applications for operational SSG tasks: automated scheduling and event planning using optimization algorithms; sentiment analysis of student communications to detect emerging conflicts; and AI-assisted budget planning and grant application preparation.

Conclusion

The integration of AI tools into student self-governance represents a promising but understudied direction in the digital transformation of higher education. Our research at TIU demonstrates that the key barriers to effective SSG – information gaps, disrupted continuity, and limited impact measurement – are amenable to I-driven solutions. However, the implementation of such solutions must be guided by the principle of augmentation rather than replacement: AI should enhance student agency and decision-making capacity, not substitute for genuine democratic participation [1].

Future research should focus on piloting specific AI tools within SSG structures and measuring their impact on student engagement and organizational effectiveness. The development of ethical guidelines for AI use in student governance is equally important, particularly regarding data privacy and algorithmic transparency.

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ARTIFICIAL INTELLIGENCE AS A FACTOR CONTRIBUTING TO TRANSFORMATION IN TEACHING SCIENTIFIC SECONDARY GENRES

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Abstract. This article proposes a theoretical model for integrating AI into genre-oriented education for engineering students. Based on existing pedagogical approaches, we claim that AI must not function not as a substitute for the student's independent work, it must be used as a tool for conscious enhancement of quality of text-building activity products.

Keywords: Artificial Intelligence; secondary scientific genres; genre-oriented approach.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАК ФАКТОР ТРАНСФОРМАЦИИ ОБУЧЕНИЯ НАУЧНЫМ ВТОРИЧНЫМ ЖАНРАМ

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Аннотация. В данной статье предлагается теоретическая модель интеграции ИИ в жанрово-ориентированное обучение студентов инженерных направлений. Опираясь на существующие педагогические подходы, мы утверждаем, что ИИ должен функционировать не как замена самостоятельной работе студента, его необходимо использовать осознано как инструмент для повышения качества продуктов текстовой деятельности.

Ключевые слова: Искусственный интеллект; вторичные научные жанры; жанрово-ориентированный подход.

Introduction

The rapid spread of generative artificial intelligence (AI) (DeepSeek, ChatGPT) calls into question the use of traditional approaches to teaching academic writing, scientific secondary genres, in particular. Traditionally, digital resources in this area have played a supporting role. For example, web search engine (Google Scholar), reference management softwares (Zotero, Mendeley), web-based application for performing text analysis (Voyant Tools), online document editor for collaborative work (Google Docs) have been widely used by researchers. These tools develop analytical skills, but do not change the fundamental intercalations between student and text. Generative AI is making changes in this area. A student can get a grammatically accurate and coherent summary of a complex engineering paper in a few seconds. On the one hand, AI offers an unprecedented support, especially for students with low English proficiency. On the other hand, the use of AI may be an obstacle to developing the skills necessary for creating secondary genres: information compression, critical selection of key sentences, checking the accuracy of information transmission. The purpose of this article is to analyze how generative AI can be integrated into the teaching process of scientific secondary genres of students of non-linguistic programs. We suppose that integrating AI as a tool for conscious enhancement of quality of text-building activity products (rather than a substitute for writing) to teaching process will improve the quality of summaries produced by students in engineering fields under the following conditions: students first write the summary themselves; the AI version is provided only after independent work; IMRAD structure is observed, numerical data and the term logic are accurate.

Theoretical framework

According to E.A. Gorbarenko and I.A. Sotova [2, 4], the secondary scientific text is the text created on the basis of the primary source as a result of analytical and synthetic processing. Key secondary genres include abstract, summary and review. For students of engineering fields, an informative monographic special summary is of particular importance [3]. The defining characteristics of the genre are as follows:

- Informativity – maximum saturation with factual data from the primary source;
- Focus on one specific study and its results;
- Focus on one specific topic and use of terminology;
- Objectivity – minimization of value judgments.

The structural model of an informative summary includes: bibliographic description, topic, presentation of the main issues, conclusions of the author of the original source, analysis of the most important statements and conclusion (according to the author of the summary)

In order to correctly highlight the elements of the source text for transfer to the summary, a student must understand the IMRAD structure (see Table 1), which is typical for most engineering articles.

Table 1

IMRAD structure

Section	Content to extract for summary
Introduction	Topicality, literate review, research problem, hypothesis, aim of study
Methods	Materials, equipment, procedures, parameters
Results	Numerical data, tables, graphs, units of measurement
Discussions	Interpretation, comparison with prior work, conclusions

As noted by I.A. Sotova, the genre-oriented approach is understood as “the focus of language education on mastering speech activity in the genre aspect, through the targeted development of genre forms based on models of speech genres that are relevant to a particular contingent of students” [4, p. 427]. The main principles of the approach: *the analysis of genre samples* (students study real scientific texts, highlighting the purpose, structure and linguistic features); *modeling* (creating drafts using templates and collective writing); *autonomous writing* (students apply the learned model to the new source text); *critical analysis and editing* (students compare their texts to samples and make corrections).

With the framework of our study we make an attempt to integrate AI to teaching writing based on approach described above.

According to L.V. Blizno et al. digital educational resources can be classified as follows (see Table 2) [1]:

Table 2

Classification of Digital Educational Resources

Category	Examples	Primary function
Demonstrative	Video, animations, infographics	Visualisation
Interactive	Virtual labs, quizzes, simulations	Engagement and practice
Instructor-oriented	Lesson plans, presentations	Course management

One more category can be added to this traditional typology – generative AI systems. Unlike static resources, generative AI creates new texts in response to a user request or *prompt*. The use of IA for creating texts causes both opportunities and challenges.

The opportunities include personalized support for students fighting with difficulties in writing texts, generating multiple options for analysis, reducing cognitive load during the initial planning phase. The challenges or disadvantages in this case include: the probability to generate ‘plausible’, but actually incorrect statements describing objects that are nonexistent or imperceptible to human observers (these results are called “hallucinations”); often the lack of ability to correctly process numerical data and units of measurement.

Based on genre-oriented approach and taking into account the opportunities and limitations above, we propose a theoretical model for integrating AI into genre-oriented education for engineering students.

Methods and results

The study will involve students of engineering programs ($n \approx 20-30$) from Novosibirsk State Technical University. The inclusion criteria are: enrollment in an engineering program; English proficiency level of B1 (Intermediate); no prior instruction in academic abstract/summary writing is allowed.

The trail teaching will consist of three 90-minute sessions conducted over a period of three weeks. The sessions will follow a four-stage model proposed in the theoretical section. The four-stage model for integrating AI into the teaching of an informative summary to students of engineering programs includes the following stages:

1. Independent writing

A student receives an authentic scientific article on their major in English, and writes a summary on his/her own, using traditional resources (dictionaries, clichés, templates).

2. Generation of a text by AI

The student receives an AI summary of the same article, generated as a result of the prompt, which requests the same structural elements. The students are informed that the generated text is not a sample, but a potentially erroneous draft.

3. Comparative analysis

The student compares his/her summary to the AI version using key criteria: numerical data accuracy, IMRAD compliance, terminological accuracy, adequacy of compression, use of clichés. The student fills out a table of discrepancies, records errors in the AI version and elements that can be improved in his/her own work and formulates an answer to the question "What does AI do well and what an engineer should always do himself?"

4. Collective editing and reflection

In small groups, students discuss their findings, edit their own texts analyzing both results, based on the strengths and avoiding mistakes of each one. As a result, students have thoroughly-analyzed texts of summary using the strengths of both generative AI and students' analysis and critical thinking.

We suppose that the use of described model may have benefits and drawbacks and limitations, namely:

1. Sensitivity to prompts

The quality of AI output varies greatly depending on the wording of the request.

2. Institutional policy

In many universities there are no clear rules for the use of AI; assessing academic integrity remains a challenge.

3. Digital inequality

Not all students have equal access to AI tools.

4. Long-term retention of skills

It is unclear whether comparative analysis leads to sustained improvement in writing skills or only to temporary improvement in results.

5. Generalizability

The model is developed for creating an informative summary of technical scientific article, its applicability to other genres and disciplines is unclear.

It is worth mentioning about three instruments that will be used to collect data:

1. Pre-test and post-test writing task. Students will write an informative summary of an unfamiliar engineering article.

2. Rubric for summary assessment. A five-criteria rubric will be used (Numerical accuracy, IMRAD adherence, Terminological precision, Compression adequacy, Use of clichés)

3. Student comparison tables. During Stage 3, students will complete structured tables documenting discrepancies between their summary and AI versions. These tables will be collected and analyzed qualitatively to identify recurring AI error patterns.

Thus, we expect to get the following results:

- Quantitative expectations – a statistically significant increase in post-test scores compared to pre-test scores;
- Qualitative expectations – Student comparative tables will reveal recurrent AI error types, e.g. omission of units of measurement, confusion between methods and results.

Conclusion

In this article, it was proposed to integrate AI into the teaching scientific secondary genres to engineering students not as a replacement for human writing, but as an auxiliary tool, the results of which must be treated critically. Based on the genre-oriented approach and structural requirements, we proposed a four-stage model to be used for creating high-quality text of informative summary. We highlighted typical AI errors and showed that these errors become a valuable learning resource.

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THE USE OF ARTIFICIAL INTELLIGENCE FOR CORRECTING CROSS-LINGUISTIC INTERFERENCE IN FOREIGN LANGUAGE LEARNING

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Abstract. The article examines the use of artificial intelligence for correcting cross-linguistic interference in foreign language learning. Particular attention is paid to the contrastive analysis of the phonetic, grammatical, and lexical systems of French and English. The study identifies typical learner errors caused by language transfer and proposes AI-based methods for their detection and correction.

Keywords: Cross-linguistic interference; artificial intelligence; foreign language learning; contrastive analysis; error correction.

ИСПОЛЬЗОВАНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА ДЛЯ КОРРЕКЦИИ МЕЖЪЯЗЫКОВОЙ ИНТЕРФЕРЕНЦИИ У ИЗУЧАЮЩИХ ИНОСТРАННЫЙ ЯЗЫК

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Аннотация. В данной статье рассматривается использование искусственного интеллекта для коррекции межъязыковой интерференции при изучении иностранных языков. Особое внимание уделяется сопоставительному анализу фонетической, грамматической и лексической систем французского и английского языков. Выявляются типичные ошибки обучающихся и предлагаются способы их коррекции с использованием технологий искусственного интеллекта.

Ключевые слова: межъязыковая интерференция; искусственный интеллект; обучение языкам; сопоставительный анализ; коррекция ошибок.

Introduction

In contemporary linguodidactics, the increasing role of multilingualism has intensified the need to address challenges associated with foreign language acquisition. One of the most persistent and theoretically significant issues is cross-linguistic interference, defined as the transfer of linguistic features from a learner's first or previously acquired language into the target language, often resulting in systematic errors [5]. This phenomenon is particularly salient in the case of French and English, which, despite historical proximity, demonstrate substantial structural differences. Recent developments in artificial intelligence (AI), particularly in natural language processing and speech recognition, enable fundamentally new approaches to error detection and correction. AI systems allow for automated analysis of learner language, identification of recurrent interference patterns, and generation of personalized feedback [3]. The aim of this study is to analyze cross-linguistic interference between French and English at phonetic, grammatical, and lexical levels and to evaluate the effectiveness of AI-based tools in correcting such errors.

Theoretical framework

This study is based on the theoretical principles of second language acquisition (SLA), contrastive linguistics, and contemporary approaches to artificial intelligence in language learning. The concept of language interference is central to the analysis and is examined through the perspective of language transfer theory, as well as cognitive and data-driven models of language processing. Language (or cross-linguistic) interference between French and English represent a specific challenge in foreign language acquisition, affecting multiple levels of language structure. These variances are primarily derived from interference, as described in the works of Terence Odlin and Rod Ellis.

To fully evaluate the potential of artificial intelligence in helping learners overcome language interference, there is a need to define the phenomenon of cross-linguistic interference itself. According to Kushnazarova Y.K, language interference (or cross-linguistic interference) is defined as influence of a learner's first language on the production of a target language. This influence may occur in various linguistic levels, including grammar, vocabulary, pronunciation [3].

The concept of cross-linguistic interference is closely related to the broader notion of language transfer in second language acquisition theory. According to T. Odlin, transfer encompasses both positive and negative influences of prior linguistic knowledge on the acquisition of a new language [5].

From a contrastive linguistics perspective, interference may occur due to structural differences between languages. As Ellis emphasizes, learners rely on

previously internalized linguistic systems when processing new input, which leads to expected error patterns [1]. These patterns need to be effectively modeled and analyzed with the usage of AI systems.

Methodology and results

As mentioned above, cross-linguistic interference may occur in different levels of the target language. Observations were carried out on a sample of second-year linguist students (groups IYA-41 and IYA-45). This empirical research revealed the most widespread errors, which include:

1. Errors at the phonetic level

Phonetic interference between French and English stems from fundamental differences in their phonological systems. French is characterized by relatively stable vowel articulation, the presence of nasal vowels, and fixed stress patterns, whereas English exhibits vowel reduction, complex diphthongization, and variable stress [6].

Lack of vowel reduction:

“*Photograph*” pronounced as [fo.to.graf], however in French it’s correctly pronounced as [ˈfəʊ.tə.ɡra:f]

Incorrect stress placement:

In French, word stress is consistently realized on the final syllable, whereas in English, stress placement is variable and lexically determined. For instance, a learner may pronounce the word “*photograPHIE*” as “*PHOtographie*” because of the word in English “*photograph*”

From an AI perspective, such errors can be detected through acoustic modeling and speech recognition algorithms. Modern AI systems analyze prosodic features (stress, rhythm, intonation) and segmental accuracy, comparing learner output to native benchmarks. Importantly, these systems can provide visualizations (e.g., spectrograms, stress markers) and individualized feedback, thereby facilitating phonetic awareness and self-correction [3].

2. Errors at the grammatical level

Grammatical interference between French and English is particularly significant due to differences in article usage, tense-aspect systems, and syntactic constructions.

Article usage

French employs articles more consistently than English, which often leads to overgeneralization. For Example (profession): *Il est médecin*, however learner may make a mistake and add an article: *Il est un médecin*

This error reflects negative transfer from English (He is a doctor). AI-based systems can detect such patterns by identifying non-target-like article usage in nominal predicates and providing rule-based explanations.

Predicate Structures and Semantic Transfer

A good example of interference involves age expressions, learner may say “*Je suis 20 ans*” instead of “*J’ai 20 ans*” This reflects direct transfer from English (I am 20 years old) where people use the verb “to be” to express their age. AI models trained on parallel corpora can identify such constructions and suggest corrections based on semantic equivalence rather than surface structure.

Tense and Aspect

The mismatch between French passé composé and English past tense forms leads to frequent errors “I have seen him yesterday” and “I saw him yesterday”. AI systems using contextual language models can detect temporal adverbials (e.g., yesterday) and flag incompatible tense usage, providing explanations grounded in aspectual distinctions.

3. Errors at the lexical errors

Lexical interference frequently occurs due to the shared Latin origin of many French and English words.

False Cognates

Learners often use “*actuellement*” (as actually) in their speech, however they need to use the word “*en fait*”. Same situation we can observe with the word assister a (as assist), while there is a need to use the word “*aider*”. Trough AI systems which use large lexical databases and contextual embeddings can help to find out semantic errors and, as a result, suggest appropriate options.

Collocational Errors

Learners often produce grammatically correct but pragmatically unnatural combinations. For instance, Learner may say in French “*Je suis chaud*” to mean “I am hot” (feeling hot/angry) instead of “*J’ai chaud*” for physical warmth. Such types of errors learners can eliminate with the help of corpus-based AI models that analyze frequency and acceptability of collocations in authentic language use.

Incorrect preposition choice

Learners often choose preposition relying on their knowledge in English, however pragmatically it’s not always correct. For instance, learner may say “*Je pense ce que tu dis*” instead of “*Je pense a ce que tu dis*” due to English influence “I think what you say”

Artificial intelligence (AI) is considered one of the best ways to eliminate challenges associated with language interference and other obstacles in second language acquisition. To be more precise, AI can contribute to the following areas:

1. Personalization: Learners’ individual characteristics (including learning pace, preferred learning styles, and psychological, physical, and physiological traits) significantly influence language acquisition. AI-powered applications can adapt

to these differences, creating personalized learning pathways that accommodate varying learner profiles. By tailoring exercises to individual needs, AI can help mitigate interference from the native language that arises when students rely on habitual patterns or structures from their first language.

2. Feedback: Feedback is essential for eliminating errors, including those caused by language interference. Learners can use AI systems to evaluate their performance in speaking, writing, listening, and grammar, providing corrective guidance that highlights errors related with language interference. This immediate feedback helps learners recognize and adapt habitual patterns transferred from their native language. Finally, it helps to master their accuracy and fluency in target language.

3. Cultural Factors: Cultural differences may occur between the learner's mother tongue and the target language can exacerbate the problem with interference by limiting the learner's ability to form meaningful associations. AI applications can close a gap by providing immersive simulations, virtual contexts, and culturally rich examples that make the target language easier to understand.

4. Semantic Understanding: Idioms, proverbs, jokes, and colloquial expressions that exist in target language may provoke a conflict with the learner's native language conventions therefore this factor affects the creation of interference at the semantic level. AI may help learners to overcome problems with cultural-specific realities by offering explanations, contextually grounded examples, and interactive exercises that clarify meaning. Finally, learners may absorb these cultural-specific realities in target language without relying on equivalents in mother tongue. [7]

Conclusion

Cross-linguistic interference between learner's mother tongue and target language shows a systematic and predictable challenge that hinders foreign language acquisition. Its manifestations at phonetic, grammatical, and lexical levels can be effectively analyzed through contrastive linguistics and eliminated using modern AI technologies.

Errors at the phonetic level, AI-powered speech recognition systems can identify issues such as the lack of vowel reduction (e.g., pronouncing all vowels clearly as in French) and incorrect stress placement (e.g., transferring fixed French stress patterns to English words). By analyzing acoustic features and comparing them with native speaker models, AI offers immediate corrective feedback and visual support. This factor allows learners to fix their pronunciation more accurately.

Errors at the grammatical level, AI systems may detect and correct errors related to article usage (e.g., overgeneralization in nominal predicates), predicate structures (such as "Je suis 20 ans" instead of "J'ai 20 ans"), and misuse of tense and aspect (e.g., "I have seen him yesterday"). Through contextual analysis, these systems not

only correct the form but also explain the rule, that allows learners to comprehend significant differences between French and English grammar.

Errors at the lexical level, AI effectively eliminates errors involving false cognates (e.g., “actuellement” vs. “en fait”), collocational errors (e.g., “Je suis chaud” instead of “J’ai chaud”), and incorrect preposition choice (e.g., “Je pense ce que tu dis” instead of “Je pense à ce que tu dis”). By relying on large corpora and semantic modeling, AI can suggest contextually appropriate alternatives and reinforce natural language use.

A key advantage of artificial intelligence is its ability to personalize instruction, identifying individual patterns of interference and targeting specific weaknesses. This ensures that all types of errors (phonetic, grammatical, and lexical) are eliminated systematically and efficiently.

Future research should focus on integrating AI tools into pedagogical frameworks and evaluating their long-term impact on language acquisition outcomes.

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ENTWICKLUNG KREATIVER SCHREIBFÄHIGKEITEN DER LINGUISTIK-STUDIERENDEN IM DEUTSCHUNTERRICHT MIT EINSATZ VON KÜNSTLICHER INTELLIGENZ

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Abstract. Der vorliegende Artikel ist der Untersuchung des Einsatzes von Künstlicher Intelligenz bei der Entwicklung kreativer Schreibfähigkeiten der Linguistik-Studierenden im Deutschunterricht gewidmet. Es werden die in der Russischen Föderation verfügbaren KI-Modellen analysiert, die anzuwenden sind, um Entwicklung kreativer Schreibfähigkeiten abzu zielen.

Schlüsselwörter: Künstliche Intelligenz, kreatives Schreiben, KI-Modelle, Entwicklung der fremdsprachlichen Schreibfertigkeit.

ФОРМИРОВАНИЕ НАВЫКОВ КРЕАТИВНОГО ПИСЬМА НА НЕМЕЦКОМ ЯЗЫКЕ СТУДЕНТОВ-ЛИНГВИСТОВ С ПОМОЩЬЮ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

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Аннотация. Статья посвящена исследованию внедрения искусственного интеллекта в процесс формирования навыков креативного письма у студентов-лингвистов на занятиях по немецкому языку. Анализируются доступные в Российской Федерации ИИ-модели, которые могут быть применены для развития навыков креативного письма.

Ключевые слова: искусственный интеллект; креативное письмо; обучение иноязычной письменной речи.

Einführung

Kreative Schreibfertigkeiten sind ein wichtiger Bestandteil von Fertigkeiten der zukünftigen Linguisten, eine der wichtigsten Komponenten derer beruflichen Kompetenz. Unter kreativem Schreiben verstehen wir den Prozess der Erstellung eines neuen, originellen Produktes, eines individuellen Textes, der den Prozess der Welterkenntnis des Autors und seiner Selbsterkenntnis in dieser Welt widerspiegelt [6, S. 190]. Aus methodischer Sicht ist kreatives Schreiben eine altersübergreifende

Technologie zur Entwicklung der schriftlichen Sprachproduktion, die Übungen unterschiedlicher Komplexität sowie unterschiedlicher Inhalte und Formen umfasst [7, S. 209].

Zurzeit ist aktiver Einsatz der Künstlichen Intelligenz im Fremdsprachenunterricht ein vielversprechendes Feld, weil auch in der Ausbildung fortschrittliche Technologien anzuwenden sind [5, S. 114].

Theorie

Die Entwicklung der Schreibfertigkeiten ist ein wesentlicher Bestandteil des Deutschunterrichtes. Kreatives Schreiben fördert die Kommunikationsfähigkeit, das kritische Denken und Argumentationsfähigkeit der Studenten und ihr kreatives Potenzial. Im Unterricht müssen auch die Altersmerkmale von Studenten berücksichtigt werden. Laut A.A. Aljewa sind für die Altersstufe von etwa 18-22 Jahren sowohl positive als auch negative Seiten typisch. Zu den positiven zählt man ein aktives Gedächtnis, flexible Denkfähigkeit, hohe Fähigkeit zum Verständnis komplexer Sprachstrukturen, aktive Ausbildung des analytischen Denkens, Motivation zu lernen und etwas Neues zu schaffen. All dies trägt zur erfolgreichen Arbeit bei Erstellung einzigartiger kreativer Texte bei. Negative Aspekte umfassen Probleme mit der Selbstorganisation, dem Zeitmanagement sowie für die Generation Z typisches fragmentiertes Denken [1, S. 7-8]. Zur Lösung dieser Probleme schlagen wir den Einsatz von der Künstlichen Intelligenz (weiter als KI bezeichnet) vor.

KI wird aktiv in alle Bildungsprozesse integriert. In der Methodik des Fremdsprachenunterrichts wird KI als eine Reihe moderner Technologien definiert, die für die Erstellung individueller Lernstrategien, Nachahmung menschlicher Denkprozesse, Durchführung von Kontrolle und Rückmeldung für Lernende genutzt werden können [8, S. 8-9]. Somit haben die Fremdsprachenlehrkräfte einen zusätzlichen „Helfer“, der Kommunikation auf verschiedenen Sprachniveaus simulieren kann. KI kann eine Analyse der von Studierenden geleisteten Arbeit durchführen und Ergebnisse sofort bereitstellen. Das spart Zeit der Lehrkraft und ermöglicht für die Lernenden die Arbeit in einem neuen, für die Generation Z interessanten Format.

Derzeit gibt es eine breite Auswahl verschiedener KI-Modelle und KI-Programme, die in den Prozess der Entwicklung kreativer Schreibfähigkeiten integriert werden können. E.V. Suewskaya und D.A. Schinkarenko betrachten **Peer AI Tutor** als ein Werkzeug für Entwicklung der schriftlichen Sprachproduktion im Deutschunterricht [4, S. 296-297]. Seine charakteristischen Merkmale sind die Fähigkeit, Genre-merkmale der Texte zu erkennen, und die Erstellung persönlicher Empfehlungen, die helfen, einen Plan zur weiteren Verbesserung der Kompetenzen auszuarbeiten.

O.V. Dreyfeld betrachtet den KI-Einsatz als ein Teil der Methodik des Fremdsprachenunterrichts, insbesondere zur Verbesserung der kreativer Schreibfähigkeiten [2, S. 390-392]. Die Forscherin stellt den folgenden positiven Effekt nach der Nutzung der neuronalen Netze **Flyvi** und **GPT-4** fest: die Förderung der Motivation und Interesse an der Erfüllung schriftlicher Aufgaben, Verbesserung der Fähigkeiten

im Umgang mit stilistischen Mitteln und gestiegene Präzision der Formulierungen. Die Frage nach der wahren Kreativität und Originalität der mit Hilfe von KI erstellten Texte bleibt jedoch offen. Derartige Texte werden jetzt von Computern auf Grund der von Menschen entwickelten Datenbanken erstellt, das heißt, sie können keinen Anspruch auf absolute Authentizität und Originalität erheben.

Methoden und Resultate

Derzeit steht eine Vielzahl von KI-Modellen methodischen Zwecken zur Verfügung. Unter inländischen KI-Systemen sind GigaChat, Alissa AI (YandexGPT), Kandinsky (über GigaChat verfügbar) und *Schedewrum* hervorzuheben. Gegenwärtig sind sie in der Russischen Föderation kostenlos und können ohne VPN genutzt werden. Auch ausländische Entwickler bieten eine Reihe effektiver KI-Systeme an, wie DeepSeek (ebenfalls kostenlos und ohne VPN), *ChatGPT*, *Claude*, *Midjourney* (die Nutzung eines VPNs und ein Abonnement für einen bequemeren und erweiterten Funktionsumfang ist erforderlich).

Wir haben eine Reihe von KI-gestützter Übungen entwickelt, die Lehrkräfte für Verbesserung kreativer Schreibfähigkeiten der Linguistik-Studierenden, die Deutsch als zweite Fremdsprache lernen, im Deutschunterricht einsetzen können. Diese Reihe umfasst:

1. Übungen zur Arbeit mit Texten (DeepSeek, GigaChat, Alisa AI):

a) Studierende bitten das KI-Modell, den Anfang einer fiktionalen Geschichte zu schreiben und setzen diese dann selbstständig fort. Umgekehrt schreiben die Studierenden den Anfang der Geschichte und die KI setzt sie fort;

b) Studierende bitten das KI-Modell, fünf Schlüsselwörter zu einem vorgegebenen Thema auszuwählen und schreiben dann eine Geschichte damit / oder umgekehrt;

c) Studierende bitten das KI-Modell, die Qualität eines bereits geschriebenen Textes zu bewerten und Ratschläge zu einer Verbesserung zu geben;

d) Studierende und das KI-Modell verfassen einen Text gemeinsam, in dem sie abwechselnd jeweils einen Satz schreiben, um anschließend einen Text zu erstellen;

e) das KI-Modell erfindet und beschreibt die Hauptfiguren einer Geschichte, und Studierende schreiben eine Geschichte mit deren Beteiligung;

f) Studierende bitten die KI um Hilfe bei der Formulierung einer Idee für einen kreativen Text / einer Handlung für eine Geschichte. Anschließend schreiben Studierende selbst einen Text nach der Idee der KI;

g) KI hilft bei der Auswahl von stilistischen Mitteln für einen bereits von Studierenden erstellten kreativen Text;

h) jeder Student in der Gruppe erhält einen vom KI-Modell erstellten Satz, und dann verwenden Studierende diese Sätze in ihren Geschichten;

i) Studierende erhalten von der KI jeweils ein Wort zu dem aktuellen lexikalischen Thema, an dem sie gerade arbeiten. Jeder muss nacheinander einen

Satz mit diesem Wort schreiben, sodass ein zusammenhängender Text entsteht. Die Aufgabe kann in einem Gruppenchat gemacht werden;

j) jeder Student schreibt einen Satz. Anschließend laden sie diese Sätze in das KI-Modell herein, das auf der Grundlage dieser Sätze einen Text erstellt. Die Sätze könnten beispielweise zu einem bestimmten Thema verfasst sein oder grammatische Konstruktionen enthalten, an denen gerade im Deutschunterricht gearbeitet wird.

2. Übungen zur Arbeit mit Bildern (*Schedewrum, Kandinsky*):

a) KI generiert ein Bild zu einem vorgegebenen Thema, und die Studierenden verfassen schriftlich dessen Beschreibung oder einen Aufsatz darüber, was sie sehen;

b) Studierende teilen sich in Gruppen von 3-4 Personen auf und generieren mit Hilfe von KI verschiedene Charaktere. Laut dem Aussehen der Charaktere schreiben sie deren Beschreibung. Anschließend schreiben sie gemeinsam eine Geschichte, an der die generierten Charaktere teilnehmen.

Zum Beispiel nutzen wir das KI-Modell DeepSeek für die Analyse eines Teils des Aufsatzes zum Thema "Lesen", der von einem Studenten des 4. Studiensemesters geschrieben ist. Unsere Anfrage sah wie folgt aus: *analysiere einen Teil des Aufsatzes zum Thema "Lesen". Identifiziere Fehler, darunter stilistische Fehler. Schlage vor, wie wir den Text mit stilistischen Mitteln verbessern können. Dann setze den Text mit deinen drei Sätzen fort. Das Sprachniveau sollte A2 sein. Der Stil sollte nicht umgangssprachlich sein.* Bei der Formulierung der Anfrage nutzten wir die Regeln, die dazu halfen, die KI-Antwort präziser zu gestalten: Man sollte das Sprachniveau, den Stil, das Thema und den Umfang des kreativen Textes angeben. Man sollte präzisere Formulierungen verwenden: nicht einfach "korrigiere den Text", sondern "analysiere, korrigiere Fehler, schlage Änderungen vor". All dies half, qualitativ hochwertige Ergebnisse zu erzielen. DeepSeek korrigierte grammatische und logische Fehler, schlug die Verwendung von Metaphern (*ich verschlinge nicht jedes Buch*), Personifikation (*bis mich ein Werk mit seinem Klang oder Titel anspricht*) und rhythmischen Satzbau vor. Er setzte den Text fort und beendete ihn logisch. Zu den negativen Seiten dieses neuronalen Netzes zählten wir die Verwendung von Lexik, die für das Niveau A2 zu komplex sein könnte (*verschlingen, verweilen*), sowie die Verwendung der Wörter „doch“ und „etwa“, was den Stil des Textes umgangssprachlich macht. Unser Experiment zeigte, dass die KI trotz einiger Ungenauigkeiten mit der Erstellung und Redaktion kreativer Texte zurechtkommt.

Zusammenfassung

O.P. Schaban unterscheidet drei Phasen, die in den Prozess der Erstellung eines schriftlichen Textes durch die Lernenden eingehen: Planung, Formulierung und Überarbeitung des Textes [9, S. 142]. Die Verwendung der oben angebrachten Übungen ist in jeder dieser Phase möglich. Das trägt zur Entwicklung umfassender schriftlichen Sprachproduktion in der Fremdsprache bei: von der Entwicklung der Fähigkeit, Ideen zu generieren, bis zur Fähigkeit, eigene und fremde Texte zu analysieren. Der Wechsel zwischen Einzel- und Gruppenarbeit ermöglicht es den

Studierenden, einen eigenen kreativen Schreibstil zu finden sowie Ideen mit anderen auszutauschen und etwas Neues und Nützliches zu entdecken. Solche Arbeit kann auch dazu beitragen, Angst vor schriftlichen Arbeiten abzubauen [3, S. 119]. Somit kann der Einsatz Künstlicher Intelligenz tatsächlich zu einem nützlichen und praktischen Verfahren für die Entwicklung kreativer Schreibfähigkeiten im Deutschunterricht werden.

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ACTIVATING MEMORY FOR CHARACTERS IN TECHNOLOGY-AIDED TEACHING OF CHINESE WRITING TO UNDERGRADUATE STUDENTS

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Abstract. The paper investigates the role of memory for characters in technology-aided teaching of Chinese characters applying the associative method. It demonstrates associations to Chinese words which students created to memorize the words during a teaching experiment. Control test showed an improvement of 41% in students' writing skill.

Keywords: Memory for Chinese characters; associations; associative method.

АКТИВИЗАЦИЯ ПАМЯТИ НА ИЕРОГЛИФЫ ПРИ ОБУЧЕНИИ СТУДЕНТОВ КИТАЙСКОЙ ПИСЬМЕННОСТИ С ПОМОЩЬЮ ЦИФРОВЫХ ТЕХНОЛОГИЙ

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Аннотация. В статье исследуется роль памяти на иероглифы в обучении студентов китайским иероглифам с помощью цифровых технологий и ассоциативного метода. Демонстрируются ассоциации, созданные студентами в ходе учебного эксперимента. Контрольный тест показал улучшение навыков письма у студентов на 41%.

Ключевые слова: Память на китайские иероглифы; ассоциации; ассоциативный метод.

Introduction

Due to the growing demand for Chinese language learning both in the professional field and in the tourism sector, it becomes necessary to update the language teaching methodology and aids. It can be noted that even students with standard pronunciation and fluent speaking have difficulty reading and writing because they cannot memorize Chinese characters. Consequently, the work examines the principles of memory for characters in terms of teaching Chinese writing.

The object of the study is a process of teaching Chinese writing to undergraduate students of Sectional Regional Studies. The subject of the study is a set of exercises for teaching Chinese writing based on the principles of memory for characters and using digital technologies. The purpose of this research is to identify the role of memory for characters in technology-aided teaching Chinese writing to undergraduate students. The results may find implication in teaching Chinese writing in higher educational institutions along with the traditional methods.

Theoretical framework

From the perspective of semiotics, a Chinese character is an iconic sign referencing to denotatum without fixating the phonetic sequence of the sound form of the word. It is the non-linearity of the character as a sign consisting of radicals, which are made up of strokes, that makes it difficult to memorize and reproduce in writing [3]. The meaning of radicals in a compound character mostly forms core semantic feature of this character, which helps to create associations to words. Memory for Chinese characters unites auditory and musical memory focused on sound form of the word, semantic memory dealing with meaning of the word, visual and motor memory responsible for graphic form and order of strokes in the character [4]. Associative memory is capable of bounding a new word in all its aspects to learner's previous knowledge.

Competence-Based approach defines goals of teaching process and orients it towards the results, forming professional competences [5]. The purpose of teaching Chinese characters is to master the competence of written communication in Chinese. There are several approaches that determine how to teach Chinese characters effectively: traditional approach, cognitive approach, one element literacy teaching approach. The latter splits into character origin teaching method, word meaning teaching method, grapheme teaching method, character family teaching method and image-text literacy method [1]. Despite the domination of traditional approach, there is also a trend towards an associative approach and mnemonics. Associative method suggests creation of verbal or visual associations to new characters by the teacher or by each student individually [2]. Along with the associative method, the use of digital technologies also contributes to memorizing Chinese characters by increasing students' motivation and following spaced repetition principles. Teachers have many options for creative lesson planning with Learning Management Systems, digital exam assessment tools, document collaboration tools and game-based authoring tools as well as the ones powered by AI technologies.

Methods and results

The practical investigation has been carried out with the help of the following complex of scientific methods:

1. Quantitative and qualitative data collection methods: a questionnaire with closed, open and alternative questions for Chinese native speakers; a verification pedagogical experiment; opinion questionnaires for students from the experimental group; diagnostic and final tests; forms for collecting students' associations.

2. Statistical analysis of responses to questionnaires, results of diagnostic and final tests.

3. Content analysis of students' associations to Chinese characters.

1. Practical potential of the research has been realized within a pedagogical experiment confirming the associative method's value for HSK3 Chinese character acquisition. It was conducted on the bases of NSTU among the second-year students of Sectional Regional Studies. The experiment included three stages: diagnostic, formative (teaching), and control. The diagnostic-stage questionnaire revealed students' positive attitudes toward association-based learning, though additional motivation was needed for students to create their personalized associations. A diagnostic test included 50 fill-in tasks similar to tasks 61-65 of the HSK 3 exam (HSK 3.0) and checks 50 common words corresponding to HSK 3 level of language proficiency. The test showed an average of just 3 correct answers per student (6% accuracy). The most common errors were missing characters, misuse of radicals, stroke addition or subtraction.

Teaching materials designed in the framework of our research include theoretical notes and five sets of exercises for the formative stage of the experiment. Each of the sets consists of three exercises:

– the first exercise aims at bounding an association with its stimulus;

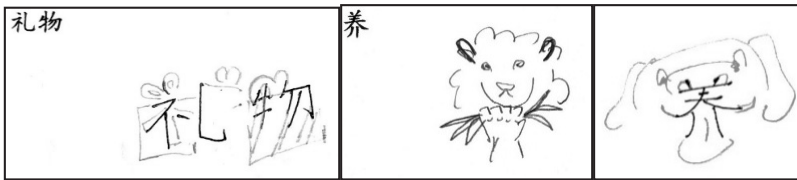
– the second exercise practices recognition of characters or their controlled use in context;

2. – the third exercise encourages freer written communication.

Theoretical notes provided information about 50 Chinese words, their meaning, pronunciation, use in context and etymology. They were presented on VK Workspace for easy access and served students as stimuli for creating associations to the words as part of independent homework. Content analysis of associations collected during the formative stage showed verbal associations dominating (83%), followed by visual (12%) and combined (5%). Students managed to picture visual associations primarily for concrete nouns (e.g. 礼物), and action verbs (e.g. 养) based on semantic or graphic similarity (see Pic.).

Verbal associations were primarily based on radical meanings and etymology of characters as stimuli. For example, the word 安静 *ānjìng* 'quiet' combines characters 安 with radicals 宀 *mián* 'roof' and 女 *nǚ* 'female'; 静 with a radical 'plant-green' 青 *qīng* and phonetic 'two-hands-pull' 争 *zhēng*. These stimuli are traced in the students' associations "a woman under the roof", "a woman in the house means calmness", "a green garden". Therefore, students created visual and

verbal associations and actively used them doing the developed sets of exercises to reinforce the 50 Chinese words.



Pic. 1. Examples of students' visual associations

The second opinion questionnaire was given to students at the beginning of the control stage and it confirmed sustained interest after the experimental teaching: 86% found seminars interesting, 7% rated them effective, 7% experienced confusion, with no reports of boredom or ineffectiveness. Results of a control test, which was similar to the diagnostic test, demonstrated 41% average improvement in students' writing skills, categorized as: sharp gains (>65%, 2 students), moderate progress (>40%, 5), and weaker advances (<39%, 8 students). Technology integration (Learning apps, VK Workspace online board) provided unlimited access to renewing theoretical materials for students to work independently on their homework. Moreover, interactive online tasks sustained students' motivation during the lessons.

Conclusion

As a result, consideration of memory for characters in all its aspects realized through the associative method has proven its moderate effectiveness (41% improvement) within a technology-enhanced framework. These findings position the associative method as a valuable tool for developing memory for Chinese characters among Sectional Regional Studies undergraduates, effectively balancing motivation, autonomy with the help of digital technologies. The further research is called for expanding the range of theoretical materials and practical exercises for the progressive implementation of the associative method in Chinese language classes at the university.

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INTEGRATION OF GENERATIVE AI INTO A HYBRID MODEL OF TEACHING OLD ENGLISH

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Abstract. This paper examines the potential of using generative AI as a component of a hybrid model of teaching Old English. Two scenarios of neural network integration are described: for visualizing and for generating exercises. The results are presented, confirming the increased involvement of students and the optimization of the teacher's work.

Keywords: artificial intelligence; hybrid learning; Old English.

ИНТЕГРАЦИЯ ГЕНЕРАТИВНОГО ИИ В ГИБРИДНУЮ МОДЕЛЬ ОБУЧЕНИЯ ДРЕВНЕАНГЛИЙСКОМУ ЯЗЫКУ

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Аннотация. В данной работе рассматривается потенциал использования генеративного ИИ как компонента гибридной модели обучения древнеанглийскому языку. Описываются два сценария интеграции нейросетей: для визуализации и для генерации упражнений. По итогам апробации приводятся результаты, подтверждающие повышение вовлеченности студентов и оптимизацию работы преподавателя.

Ключевые слова: искусственный интеллект; гибридное обучение; древнеанглийский язык.

Introduction

The trend towards digitalization has been observed in modern education for many years. During the COVID-19 pandemic, there was a sharp increase in the number of digital educational platforms, and more and more teachers have integrated them into their practice [1]. However, progress does not stand still, artificial intelligence is being increasingly introduced into our lives. Modern students have quickly adapted to its use in solving educational tasks, and new educational models based on AI are still under development.

This problem is particularly relevant in teaching historical and linguistic disciplines, such as the History of the English Language. The introduction of AI can become a tool for visualizing the historical context, increasing student engagement and optimizing teacher's work, but the methodological potential of generative neural networks in this area has not been sufficiently studied.

The purpose of this work is to analyze the effectiveness of using generative AI as a component of a hybrid model of teaching Old English. The study examines the experience of integrating neural networks to visualize historical material along with traditional digital tools as part of a hybrid approach. The main focus is on finding a balance between innovative technologies and the requirements of the philological discipline.

Theoretical framework

The key concept for this work is a hybrid learning model [3]. In this study, the hybrid model is understood as a way of organizing the educational process in which digital tools (including generative neural networks) are organically combined with traditional methods of work (reading, handwritten translation, working with paper dictionaries). The choice in favor of the hybrid model is due to the results of a survey of NSTU linguistics students (N=106) conducted by us as part of a study [4], which showed that, despite the high degree of smartphone use (more than 7 hours a day), 27% of students are not ready to completely abandon paper, citing better memorization of information during tactile contact with the text and during taking notes.

We identify three main reasons why the integration of AI into the teaching of the Old English language seems methodologically justified. First, AI allows you to visualize the historical context, which is remote and abstract for a modern student. Secondly, AI can take over part of the routine methodological work, namely the generation of training exercises. A teacher who uses a neural network to create tasks for working out grammatical paradigms, even if it is necessary to make edits or clarifications to the lesson, significantly reduces the preparation time for the lesson and gets the opportunity to pay more attention to individual work with students and the analysis of complex situations. At the same time, the final control over the quality of materials remains with the teacher, which reduces the risk of

methodically incorrect assignments. Thirdly, the use of AI corresponds to the digital habits of modern students. A familiar interaction environment reduces the psychological barrier to learning complex topics and increases engagement in the process. For a teacher, adapting to students' digital habits does not mean fighting gadgets in the classroom, but turning them into a legitimate learning tool.

It should be noted that generative neural networks have their weaknesses. First of all, these are "hallucinations" – the generation of non-existent language forms, artifacts in images, as well as possible problems with processing diacritics, lack of understanding of the context of the curriculum, unstable results with repeated requests. These limitations do not allow us to consider AI as a full-fledged substitute for a teacher, however, they make it an effective tool that optimizes routine work steps.

Methods and results

The study was conducted on the basis of Novosibirsk State Technical University (NSTU NETI) in the framework of the discipline "History of the English language". The study involved second-year students of the direction "Translation and Translation Studies" (N=46), divided into control and experimental groups. Along with traditional teaching methods, the experimental group used digital tools and generative neural networks (Midjourney, Kandinsky) to perform individual learning tasks. The control group worked according to the traditional method without the use of AI.

Two scenarios for the use of generative neural networks have been developed and tested:

Scenario 1: Visualization of the historical context using AI.

The students of the experimental group were asked to prepare a mini-project on the topic "Anglo-Saxon Chronicles: Language, History and Culture" using scientific articles, textbooks and the text of the work, and generate as many images as possible to visually support oral speech and immerse other students in the atmosphere of the Old English period. The students of the control group were assigned to prepare a report on the same topic without requiring the use of AI.

The results of the comparative analysis showed that the students in the experimental group demonstrated a higher level of engagement, as well as better memorized key facts about the work, which they often recalled thinking about images presented on the slides (the students answered 8 out of 10 questions). In the control group, due to insufficient technical equipment of the classroom, students prepared an oral report, during which many students were distracted by smartphones and personal conversations (up to 70% of students) and after listening could not answer many questions about the literary monument (4 questions out of 10).

It should be noted that in this scenario, the tasks in the control and experimental groups differed not only in terms of the use of AI, but also in the format of execution, which does not allow us to unambiguously attribute the differences to the integration

of neural networks. AI significantly reduces the time needed to select images and allows you to create an image for any desired piece of text, as well as not infringing copyrights when using images. However, the teacher retains an important function – to monitor the accuracy of the selected images. As mentioned earlier, neural networks often "hallucinate" by adding to images something that could not be or that does not correspond to the original work. Therefore, the teacher must be well acquainted with the work (in this case, with the "Anglo-Saxon Chronicles") and the culture of the Anglo-Saxons in particular.

Scenario 2: Generation of exercises for practicing grammar material.

The second scenario was aimed at optimizing the teacher's work in preparing an exercise to work out the definition of a strong verb class according to the proposed forms. Traditionally, for the formation of this exercise, the teacher independently selects examples of verbs of different classes and prescribes all the forms, which takes time. As part of the experiment, DeepSeek was used to generate an initial list of verbs and then create an exercise in a column-by-column format.

Example of a prompt to AI: "Make a list of 35 strong verbs in Old English (5 verbs for each of the 7 classes). For each of the verbs, specify the infinitive and the three main forms (past tense sg., past tense, participle II). Verbs should be among the most commonly used verbs in the texts of the Anglo-Saxon Chronicles.

Based on the generated list, a task was created on the platform Wordwall.net, in which the students of the experimental group were asked to sort the proposed verbs into seven columns according to their class. At the same time, relying on the basic forms allowed them to analyze the alternation of the root vowel (ablaut) [2], rather than just memorize which class each verb belongs to, and the virtual movement of the cards involved the students' kinesthetic memory.

In the control group, a similar exercise was conducted in the format of an oral survey using the verbs suggested in the textbook, where a smaller percentage of students were involved in activity (two people actively participated in the task, unlike the experimental group, where everyone performed the exercise on their phone). Saying words out loud negatively affected comprehension, so it took twice as long to analyze one word as in the experimental group. Moreover, students could not practice reading, only listening, which is not necessary in this course.

The exercises were used to practice the skill of morphological analysis to reduce the time needed to complete future translations, observations of which showed that the students of the experimental group more often and faster recognize one of the forms of a strong verb in an unknown word, restore the infinitive form and correctly translate – the students could not recognize only complex cases, while the students of the control group skipped almost every strong verb by referring to the absence of the word in the dictionary.

Thus, the exercise proved to be effective as part of a hybrid approach, and using AI to generate a list of words helped reduce the preparation time. However, it is important to note the need for the teacher to check the generated lists, as some of the proposed verbs were too complex, contained errors, or were missing from the glossary at the end of the textbook "The History of the English Language" Ivanova I. P., Chahojan L. P., Beljaeva T. M., used by students. This fact confirms the need for the teacher to retain the function of expert control when using AI to generate educational materials.

Conclusion

This research aimed to analyze the effectiveness of using generative AI as a component of a hybrid model of teaching Old English. Based on the results of the testing, we conclude that the hybrid model of teaching Old English is methodologically justified. The choice in favor of this model was made based on a survey of students who noted the lack of digital tools in the classroom, but were not ready to completely abandon the use of paper. This method takes into account the wishes of the students and harmoniously combines with the requirements of the discipline.

The hybrid model and the developed AI usage scenarios can be applied in teaching the discipline "History of the English Language" and adapted for other historical and linguistic courses, for example, to visualize the historical context or to generate exercises for practicing grammatical forms. It is important to note that the generated content must be checked by the teacher to make edits and eliminate errors.

The use of a hybrid model with AI showed positive dynamics in a number of parameters (engagement, memorization of facts, speed of recognition of verb forms). However, due to the methodological limitations of the experiment (the incompatibility of task formats and the lack of technical equipment in the classroom), the results are preliminary and require further verification. Further research may be aimed at developing methodological recommendations for the preparation of prompts for the generation of educational materials.

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LE POTENTIEL DE L'INTELLIGENCE ARTIFICIELLE DANS LA STIMULATION DE LA MOTIVATION DES APPRENANTS

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Résumé. Cet article présente les résultats d'une expérience visant à l'apprentissage de la grammaire française à l'aide de l'intelligence artificielle. On a prouvé que l'IA renforce l'intérêt pour l'apprentissage et ne constitue pas un facteur de démotivation, à condition que ses réponses fassent l'objet d'une analyse critique et que les étudiants tiennent un journal d'auto-observation.

Mots-clés: intelligence artificielle; apprentissage numérique; grammaire française; motivation.

ПОТЕНЦИАЛ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ПОВЫШЕНИИ МОТИВАЦИИ ОБУЧАЮЩИХСЯ

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Аннотация. В статье представлены результаты эксперимента по обучению грамматике французского языка с использованием искусственного интеллекта. Доказано, что ИИ повышает интерес к учёбе и не является фактором демотивации при условии критического анализа его ответов и ведения студентами дневников самонаблюдения.

Ключевые слова: искусственный интеллект; цифровое обучение; грамматика французского языка; мотивация.

Introduction

Selon Popenici et Kerr, l'IA «est constituée de systèmes informatiques capables de s'engager dans des processus humains comme l'apprentissage, l'adaptation, la synthèse, l'autocorrection et l'utilisation de données pour des tâches complexes» [1; p. 2]. Actuellement, l'intelligence artificielle fait partie intégrante de notre vie quotidienne, même des questions concernant son utilisation restent en suspens. Dans le contexte de l'éducation, l'efficacité de l'utilisation de l'IA fait l'objet de débats, mais il faut tenir compte du fait que sa mise en œuvre s'accompagne d'un certain nombre de problèmes. En particulier, ce sont des questions concernant l'influence de l'IA sur le développement de l'esprit critique des apprenants, ainsi que sur le fait de savoir si l'intelligence artificielle constitue un facteur de motivation ou, au contraire, de démotivation dans le processus éducatif. L'objectif principal est de déterminer les moyens optimaux de l'intégration de l'IA dans l'enseignement, de manière à garantir une interaction naturelle et à exclure tout préjudice potentiel pour le développement cognitif et personnel des étudiants.

Théorie

L'IA a permis de passer des méthodes d'enseignement traditionnelles à des expériences d'apprentissage personnalisées, telles que des outils d'apprentissage flexibles, des systèmes de tutorat intelligents et la notation automatisée [2][3]. Elle recèle un potentiel considérable, car elle renforce l'engagement des étudiants, améliore les résultats d'apprentissage et permet au personnel enseignant de se concentrer sur la recherche plutôt que sur les tâches administratives. De plus, l'IA peut s'adapter aux besoins des apprenants en prédisant leurs résultats scolaires et en allouant efficacement les ressources [4].

L'IA est capable de créer un profil numérique de l'élève, qui reflète ses centres d'intérêt, ses résultats, ses points forts et ses points faibles. Lorsque l'élève voit ses efforts se concrétiser dans son portfolio numérique, cela forge son identité d'apprenant: le sentiment d'être un acteur en pleine évolution, performant et actif du processus éducatif. C'est précisément cette identité qui devient une source interne de motivation [5].

Méthodologie et Résultats:

Dans le cadre d'une étude sur l'influence de l'intelligence artificielle sur la motivation des étudiants, l'intégration des technologies d'IA dans l'apprentissage de la grammaire française s'est poursuivie. Neuf étudiants de l'université technique d'État de Novossibirsk, inscrits en spécialité «Linguistique», ont participé à cette expérience. Le thème choisi pour l'étude était le «Conditionnel Passé». Des

consignes de départ ont été proposées aux étudiants. Ils ont pu les modifier en fonction de leurs propres demandes et leurs besoins éducatifs.

eg. Vous êtes un professeur de français expérimenté, spécialisé dans les niveaux avancés (B2–C1). Vous enseignez le conditionnel passé à un groupe d'étudiants adultes. Ne vous contentez pas d'énoncer les règles de formation. Mettez l'accent sur les cas complexes: la différence entre le conditionnel passé et le plus-que-parfait dans les phrases hypothétiques (regret du passé vs constat d'un fait); L'emploi dans le journalisme et le discours indirect (par exemple, «selon une source, le ministre aurait menti»).

Dans le cours de l'expérience, les étudiants tiennent des journaux afin de suivre leurs progrès, de noter les erreurs courantes et de consigner la formulation des consignes des exercices, dans le cas où celles-ci auraient été modifiées par les apprenants eux-mêmes. À l'issue de la phase expérimentale, un questionnaire original a été élaboré, comprenant, outre des questions sur l'efficacité des exercices proposés, des points liés à la composante motivationnelle de l'activité pédagogique.

Les résultats de l'enquête ont montré que la majorité des étudiants ont évalué positivement ce type de cours. Comme les principaux avantages les répondants ont noté la possibilité de faire preuve de créativité et le fait de s'éloigner des exercices traditionnels tirés des manuels scolaires. La plupart des participants de l'expérience ont apprécié le pouvoir d'observer la dynamique de leurs propres progrès. Les étudiants se sont déclarés prêts à continuer l'utilisation de l'intelligence artificielle, car, selon eux, l'assistant IA permet de construire un parcours éducatif personnalisé et d'analyser efficacement ses propres erreurs [voir fig. 1]

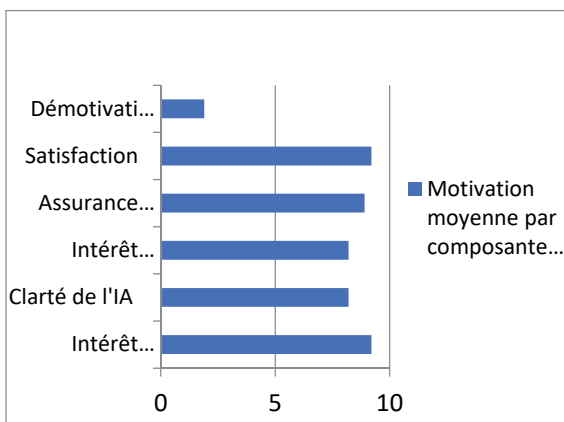


Fig. 1. Les indicateurs de motivation des étudiants

Les scores maximaux (9,2 points) ont été enregistrés pour deux paramètres. Premièrement, il s'agit de l'intérêt pour l'IA en tant qu'outil d'entraînement aux constructions grammaticales (point 2.5). Ce résultat témoigne de la grande attractivité du format interactif: les participants perçoivent l'IA non pas comme un outil technique, mais comme un partenaire motivant dans le processus d'apprentissage. Deuxièmement, il s'agit de la satisfaction globale à l'égard de l'expérience (point 5.1). La coïncidence de ces deux indicateurs indique que l'intérêt pour l'outil est indissociable de l'évaluation positive de l'expérience éducative dans son ensemble.

Le deuxième indicateur en importance (8,9 points) est la confiance dans l'utilisation pratique du conditionnel présent (point 5.2). Il est important de noter que ce paramètre n'est que légèrement (de 0,3 point) inférieur à la satisfaction globale. Ce rapport permet d'affirmer qu'une forte motivation s'accompagne d'une auto-évaluation réaliste de la préparation à la communication réelle. Les participants ne surestiment pas leurs capacités, mais se sentent néanmoins suffisamment en confiance.

Les indicateurs «clarté des explications de l'IA par rapport au manuel» (8,2 points) et «intérêt pour le suivi des progrès» (8,2 points) occupent une position intermédiaire. Les valeurs légèrement inférieures par rapport aux deux premiers paramètres peuvent s'expliquer par le fait que les manuels traditionnels conservent leur valeur aux yeux des élèves (l'IA ne les remplace pas complètement, mais les complète). Quant à l'intérêt pour les progrès, son niveau modérément élevé (8,2) montre que la composante réflexive (tenue d'un journal) soutient la motivation, mais n'en est pas le principal moteur.

L'indicateur le plus important est celui de la démotivation (1,9 point). Sur une échelle allant jusqu'à 10 points (ce qui signifierait des défaillances extrêmement fréquentes de l'IA, sapant gravement l'envie d'apprendre), le résultat obtenu est proche du minimum. Cela signifie que les participants n'ont été confrontés que dans de rares cas à des situations où l'IA les induisait en erreur ou donnait des réponses incorrectes, et même ces épisodes n'ont pas entraîné de baisse significative de la motivation. Ce fait revêt une importance fondamentale pour la conception pédagogique de ce type d'expériences: les imperfections techniques de l'IA, lorsqu'elles s'accompagnent d'une organisation méthodologique adéquate, ne constituent pas un facteur de démotivation.

Ainsi, le profil de motivation du groupe expérimental est caractérisé comme élevé et équilibré: tous les indicateurs directs se situent dans une fourchette de 8,2 à 9,2 points, et la démotivation reste à un niveau minimal. Cela permet de conclure que le format d'apprentissage proposé soutient efficacement tant la composante instrumentale que la composante émotionnelle et réflexive de la motivation scolaire.

Conclusion

Le format expérimental «IA + journal d'auto-observation» a prouvé son efficacité en tant que modèle d'apprentissage de la grammaire française axé sur la motivation. Les élèves font preuve d'un vif intérêt pour l'apprentissage, d'un faible niveau de démotivation, d'une volonté de poursuivre le travail et de recommander cette méthode à d'autres. Les principaux facteurs de motivation sont: les explications détaillées fournies par l'IA, la créativité des exercices, la possibilité d'analyser ses propres erreurs et d'observer ses progrès. Les défauts techniques de l'IA (réponses erronées, incompréhension des requêtes) ne réduisent pas la motivation générale, à condition que les apprenants développent un esprit critique vis-à-vis des réponses de l'assistant.

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ОСОБЕННОСТИ ИСПОЛЬЗОВАНИЯ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В КУРСЕ «ЧТЕНИЕ СТАТЕЙ ПО ЭКОНОМИКЕ И ТОРГОВЛЕ НА РУССКОМ ЯЗЫКЕ»

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Аннотация. Статья посвящена изучению особенностей использования ИИ при подготовке занятий по темам курса «Чтение статей по экономике и торговле на русском языке». Выявлены как положительные, так и отрицательные стороны применения ИИ в процессе обучения студентов, предложены варианты решения выявленных проблем.

Ключевые слова: Искусственный интеллект; курс «Чтение статей по экономике и торговле на русском языке»; умный поиск; помощник Алиса; плюсы и минусы ИИ.

PECULIARITIES OF USING ARTIFICIAL INTELLIGENCE IN THE COURSE "READING ARTICLES ON ECONOMICS AND TRADE IN RUSSIAN"

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Abstract. The article is devoted to the study of the peculiarities of AI use while preparing classes on "Reading articles on economics and trade in Russian." Both positive and negative aspects of using AI in the process of teaching students have been identified, and options for solving the identified problems have been proposed.

Keywords: artificial intelligence; course "Reading articles on economics and trade in Russian"; smart search; assistant Alice; advantages and disadvantages of AI.

Введение

В 70-х годах ИИ, пространная техника и энергетическая техника рассматривались как три мировых передовых техники. В нынешнее время искусственный интеллект, нанотехнологии и другие новые технологии вместе называются высокими технологиями XXI века [1, с. 4]. В контексте данной мировой политики и экономики внешнеторговые отношения между Китаем, Россией и странами Центральной Азии становятся все теснее и крепче. Сотрудничество в области экономики и торговле среди этих стран носит всеохватывающий и взаимовыгодный характер.

ИИ глубоко изменяет обучение иностранным языкам. Он приносит преподавателям и студентам новое впечатление об индивидуальном обучении, взаимодействии на занятиях и оценке преподавания.

Курс «Чтение статей по экономике и торговле на русском языке» (далее – «Чтение») является обязательной учебной дисциплиной в весеннем семестре для бакалавров третьего курса по направлению экономики и торговли Института русского языка Сианьского университета иностранных языков (далее – СУИЯ). В последние годы курс ведется по соответствующим материалам лидирующих медиа Китая и России, знакомит студентов с предметами, особенностью, каналами и средствами внешнеторговой экономики между Китаем, Россией и Странами Центральной Азии, что закладывает крепкий фундамент студентам для их работы после окончания университета.

Обзор литературы

В данный момент на китайских и российских сайтах не найдены научные результаты, касающиеся «ИИ и чтение статей по экономике и торговле на русском языке». Но существуют немало статей о «ИИ и изучении иностранного языка». В том числе Вэнь Цюфан [2, с. 722] считал: «ИИ должен передавать следующим поколениям хорошие традиции образования, способствовать трансформации системы образования, но не вызвать поворотной революции». Чжан Чжэньюй и Хун Хуацин [3, с. 43] отметили: «Технология ведения переговоров ChatGpt и другие ИИ активизируют студентов и преподавателей через установление планов учебы, представление материалов учебы и ориентацию на отработку навыков, при том в пользу самостоятельного обучения онлайн». В российской науке было предложено внедрение чат-ботов в обучение английскому языку, и на основе этого был разработан набор оригинального виртуального помощника для аспирантов [6, с. 62–66]. Ефремова [4, с. 113–120] анализировала риски неконтролируемого использования ИИ студентами, например, мошенничество, и предложила методы использования ИИ под контролем преподавателей.

Особенности активизации ИИ в преподавании курса «Чтение»

Студенты, которые учатся на третьем курсе по направлению экономики и торговли в Институте русского языка СУИЯ, уже освоили основы лексики и грамматики русского языка. Кроме того, они в достаточной мере ознакомились с экономикой России и стран Центральной Азии, но не владеют знаниями международной экономики и торговли. Курс «Чтение» требует, чтобы студенты бегло читали новостные репортажи, в процессе чего смогли овладеть основными знаниями в отрасли международной экономики и торговли, к тому же познакомиться с новейшими формами торговли, в том числе трансграничной интернет-торговлей.

Использование техники ИИ в курсе «Чтение» можно провести в следующих сценариях:

1. Выбрать соответствующие новостные репортажи, которые совпадают с темами курса.

У курса «Чтение» всего 16 занятий в одном семестре. При подготовке к занятиям преподаватель может ввести тему, которую будет объяснять на занятиях, в соответствующих инструментах, и с помощью которых преподавателю можно быстро установить материалы, использованные на занятиях.

2. Интеллектуальная обработка текста

При изучении новостных репортажей технологии ИИ – DEEPSeek, Доубао, КИМІ помогают извлечь необходимые контенты. К примеру, 19 февраля 2026 года информационное агентство "РИА Новости" опубликовало сообщение «ВЭБ: Россия имеет все шансы стать чистым экспортером беспилотников» [5]. Преподаватель может ввести команду в Доубао: «Составьте таблицу с условиями сделки, техническими терминами и названиями основных терминов по следующей ссылке: <https://ria.ru/20260219/veb-2075504565.html>» и получить нижеследующее содержание (см. Таблицу 1).

3. Поддержка интерактивного обучения

Преподаватель курса «Чтение» может использовать Умный собеседник Алисы AI для разработки и исполнения сценария самостоятельного изучения материала по темам внешней торговли. Студенты могут выступать в роли импортеров или экспортеров и проводить имитационные переговоры с Алисой. Это эффективно помогает студентам улучшить их уровень русского выражения и способности к реакции на русский язык.

4. Индивидуализированное чтение

Этот сценарий главным образом используется для домашнего задания после занятий. Преподаватель требует, чтобы студенты выбрали интересующие их материалы для чтения постоянно в одном ИИ. Следовательно, этот ИИ запоминает предпочтения при чтении этого студента, и анализирует путь его чтения, частоту запросов по терминам и барьеры для понимания материалов.

После этого ИИ может предложить учащимся несколько источников материалов более высокого уровня по внешнеторговой торговле с целью обогащения знаний студентов в этой отрасли.

Таблица 1

Термины и названия из статьи «ВЭБ: Россия имеет все шансы стать чистым экспортером беспилотников» (отрывок)

Термин	Перевод на китайский язык	Краткое описание и советы по обучению
ВЭБ (ВИБ.РФ)	俄罗斯外经银行	俄罗斯国家开发集团，文中信息发布方，常出现在大型项目融资报道中。
Чистый экспортер	净出口国	核心概念，指出口大于进口的国家。与净то-экспортер 同义。
Беспилотные технологии	无人机技术	本文核心领域，常缩略为 БПЛА（无人飞行器）。
Мониторинг стройки	建筑监控	文中列举的无人机应用场景，用于工程进度监控。
Беспилотный карьер	无人化露天矿	上述技术的具体应用场景，即实现全流程自动化的矿区。
Логистические операторы	物流运营商	指使用无人机提供配送服务的企业。

Риски и недостатки применения ИИ в курсе «Чтение»

1. Зависимость от ИИ

Студенты чрезмерно зависят от таких результатов поиска ИИ, как главной идеи, аннотации, перевода, важных терминов и словосочетания статей, которые извлекает ИИ. Это, конечно, приводит к тому, что студенты теряют способность самостоятельно читать статьи.

2. Преподаватель не может точно оценить настоящий уровень понимания прочитанных текстов студентами

Если студенты выполняют отчет по чтению, аналитические работы, домашнее задание, которые генерируют ИИ, то преподаватель не может точно узнать состояние русского языка и знания международной экономики и торговли у студентов.

Выводы

Из вышесказанного вытекает, что применение ИИ в преподавании занятий в университете – это главный тренд. Использование ИИ в образовании имеет плюсы и минусы. Более удачный путь использования ИИ в преподавании русского языка по направлению экономики и торговли заключается в следующем: Преподаватель использует ИИ для поиска материалов для занятий и последующей подготовки к занятиям. Он выдает студентам на занятиях печатные оригинальные статьи, чтобы студенты прочитали статьи без помощи ИИ, извлекли ключевые слова и словосочетания, связанные с внешней торговлей, и обобщили главные идеи содержания статей прямо на занятиях. После занятий студенты работают на постоянной основе с ранее использованным ИИ, выполняют домашнее задание.

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PROFESSIONAL TRAINING OF STUDENTS IN TECHNICAL SPECIALTIES

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Abstract. This article discusses the features of professional training for students of technical specialties at higher education institutions. Special attention is paid to analyzing the difficulties that arise when studying mathematics and engineering disciplines. There are cognitive, organizational, and motivational difficulties that arise during the learning process. The article examines the role of pedagogical control and modern digital technologies as tools for enhancing students' educational activities.

Key words: professional training of students; learning difficulties; technical education, digitalization; pedagogical control.

ОСОБЕННОСТИ ПРОФЕССИОНАЛЬНОЙ ПОДГОТОВКИ СТУДЕНТОВ ТЕХНИЧЕСКИХ СПЕЦИАЛЬНОСТЕЙ

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Аннотация. В данной статье рассматриваются особенности профессиональной подготовки студентов технических специальностей высшей школы. Особое внимание уделяется анализу трудностей, возникающих при освоении математических и инженерных дисциплин. Выделяются когнитивные, организационные и мотивационные трудности, возникающие в процессе обучения. Рассматривается роль педагогического контроля и современных цифровых технологий как инструментов повышения учебной деятельности студентов.

Ключевые слова: профессиональная подготовка студентов; сложности обучения; техническое образование; цифровизация; педагогический контроль.

Introduction

The development of digital technologies has brought about significant changes in all spheres of human life and activity, including the educational process at all levels. Educational institutions are increasingly using electronic resources and digital platforms in the learning process, and online education has become increasingly popular. At the same time, in the context of the transformation of the educational process, the problem of organizing pedagogical control as a link in the chain of the entire educational process arises, since it is precisely the stage-by-stage and continuous control that allows us to assess both the level of assimilation of educational material and to identify gaps in the preparation of students.

The educational process in technical universities has a number of specific features. Firstly, it is characterized by a significant amount of mathematical and natural science disciplines. Secondly, a significant portion of the educational material requires developed abstract thinking and the ability to apply theoretical knowledge to solving practical problems.

The scientific literature notes that the difficulties in teaching students in technical fields are caused both by the content of academic disciplines and by the specific features of the educational process in higher education [4]. A significant portion of the academic workload, the need to master complex mathematical models, and the transition to independent learning activities can hinder the successful mastery of the educational material.

Traditional forms of control, such as credit tests and exams, are not always capable of providing a full analysis to identify the difficulties that emerge during the process of learning and material assimilation. In this regard, it becomes obvious that it is necessary to use other forms of pedagogical control, in addition to the traditional ones, using modern digital technologies, which will make the process of testing knowledge more efficient and objective, and at the same time help identify difficulties in mastering the educational material at each stage of the educational process.

The aim of this research is to identify and systematize the main difficulties encountered by students in technical fields of study during their learning process, as well as to explore the possibilities of pedagogical control and digital educational technologies for overcoming these challenges.

The scientific novelty lies in the systematization of the main difficulties of teaching students in technical fields of study when mastering mathematical disciplines, as well as in the consideration of pedagogical control and digital educational technologies as interconnected tools for supporting the educational process in higher education.

Theoretical framework

The problem of improving the professional training of students in technical fields is actively discussed in Russian and foreign science.

Thus, N.V. Bordovskaya and co-authors emphasize that the development of educational technologies in higher education is linked to the need to modernize traditional teaching methods and introduce interactive forms of organizing the educational process [5]. The application of modern technologies contributes to increasing student engagement and fostering independent learning skills.

A number of studies are dedicated to analyzing the factors influencing the successful mastery of mathematical disciplines by students of technical specialties. In particular, A.A. Banin and co-authors examine the problem of predicting the effectiveness of student learning in mathematical cycle disciplines and highlight the significant role of students' foundational knowledge level [4]. V.V. Vikhman and M.V. Romm note that the introduction of digital technologies creates new models of interaction between teachers and students, as well as provides additional opportunities for individualizing learning [6].

Foreign studies also confirm the effectiveness of using digital educational tools. Thus, Abbas et al. note that the use of prompt feedback systems helps to increase student engagement and improve learning outcomes [1]. Engström and Blom emphasize the role of the educational environment and students' academic capital in the success of education in technical universities [2]. The results of research by Garza et al. demonstrate that the use of interactive platforms can serve as an effective tool for increasing students' learning activity [3].

Thus, the analysis of scientific literature shows that improving the efficiency of training students in technical fields is associated with the introduction of modern educational technologies and the improvement of the pedagogical control system.

Methods and results

The study used methods of theoretical analysis, generalization and comparative analysis of scientific literature devoted to the problems of professional training of students in technical fields.

The undertaken analysis facilitated the identification of several primary clusters of obstacles that students experience during their educational journey.

The first group includes cognitive difficulties. The transition from school-level mathematics to university-level mathematics is accompanied by a significant increase in the level of abstraction and complexity of the educational material. Higher mathematics, probability theory, and mathematical statistics require developed abstract thinking and the ability to work with formal mathematical models. As a result, many students struggle to understand theoretical concepts and apply mathematical methods to solve practical problems.

The second group includes organizational and adaptation difficulties. From the first days of study at a higher education institution, students are faced with the need to independently plan their learning activities, work with large amounts of information, and complete a significant number of assignments independently, which can negatively impact the effectiveness of their learning.

The third group is the motivational difficulties. The complexity of academic subjects and the large amount of theoretical material can lead to a decrease in students' academic motivation. In this regard, the primary role in this process remains with the teachers, who act not only as a source of knowledge but also as organizers of students' learning activities. It is the pedagogical mastery that determines the level of student engagement in the educational process and, as a result, the quality of learning material assimilation. The use of educational platforms, interactive polls, and online testing systems allows teachers to promptly assess the level of material assimilation and provide feedback to students.

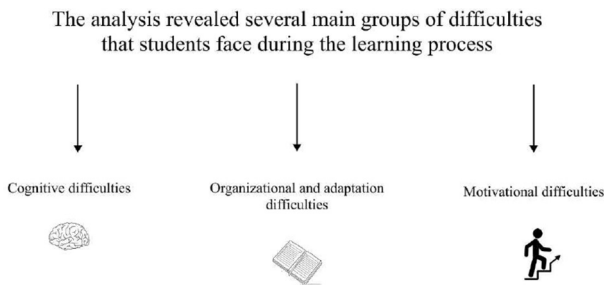


Fig 1. Category of difficulties

Conclusion

The analysis showed that teaching students in technical fields of study has a number of specific difficulties. The most significant of these are cognitive difficulties in mastering mathematical disciplines, methodological problems in perceiving theoretical material, and organizational and motivational difficulties, as shown in Fig1.

In these conditions, improving the educational process of higher education, aimed at increasing the effectiveness of training, is of particular importance. Pedagogical control and the use of interactive teaching methods play an important role in this process.

The practical significance of this research lies in the fact that the obtained results can be used to improve the methodology of teaching mathematics-related disciplines and to develop effective forms of pedagogical control in technical universities.

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THE DIDACTIC POTENTIAL OF THE GLIGLISH NEURAL NETWORK IN IMPROVING THE SPEAKING SKILLS OF LINGUISTIC STUDENTS

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Abstract. This study aims to identify the potential of digital technologies for teaching foreign language oral communication at university, with specific focus on the development of speaking skills. The research focuses on the Gliglish neural network. The findings reveal that Gliglish holds significant potential for developing both speech skills and speech abilities among students of linguistics.

Keywords: speaking; speaking fluency; artificial intelligence; AI tutor; psychological barrier.

ДИДАКТИЧЕСКИЙ ПОТЕНЦИАЛ НЕЙРОСЕТИ GLIGLISH В СОВЕРШЕНСТВОВАНИИ ГОВОРЕНИЯ СТУДЕНТОВ-ЛИНГВИСТОВ

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Аннотация. Цель данного исследования – определить потенциал цифровых технологий для обучения устному общению на иностранном языке в университете, уделяя особое внимание развитию навыков говорения. Исследование посвящено использованию нейросети Gliglish. Результаты показывают, что Gliglish обладает значительным потенциалом для развития как речевых навыков, так и речевых способностей студентов-лингвистов.

Ключевые слова: разговорная речь; беглая речь; искусственный интеллект; ИИ-тьютор; психологический барьер.

Introduction

One of the main approaches of modern foreign language teaching methodology is the communicative approach, the main goal of which is to develop students' ability to speak a foreign language fluently. Today, the integration of digital technologies has become an integral part of the modern educational environment.

First year students, in particular, frequently face psychological barriers – such as stress, insecurity, and perceived pressure – when required to speak in class, which may inhibit the improvement of their oral communication skills. These findings suggest a clear need for instructional practices that prepare students for real-life and classroom communication. Modern educators face a complex and significant challenge: identifying and selecting tools, technologies, and instructional methods that are adequate to the realities of an era defined by digital industrialization. Platforms offering instant response and dialogue – Gliglish being one such example - offer a promising way forward [3].

Theoretical framework

The relevance of this study is due to the need to develop new teaching techniques in connection with the digitalization of teaching linguistics students as one of the ways to develop oral speech.

The purpose of the article is to substantiate the effectiveness of the Gliglish neural network for the improvement of oral speech of linguistics students within the framework of professional education.

Speaking is an oral form of communication through which information is exchanged by means of language, contact and mutual understanding are established, and the interlocutor is influenced in accordance with the speaker's communicative intention [2, 2015]. In Ha Thanh Thao's and Luong Khanh Ly's research [4, 2025] Gliglish AI support speech development mainly by giving students: frequent speaking practice in a low-pressure environment; immediate feedback on pronunciation, grammar, and vocabulary; conversation practice that makes speaking more natural and fluent; more confidence and less anxiety about making mistakes [4, 2025].

Naima Ahmad Al-husban's research examines whether the ELSA speech analyzer, an AI-assisted language learning tool, can improve the speaking skills of university EFL students [1, 2025]. These significant results should serve as motivation for EFL tutors to familiarize themselves with various AI-assisted language tools. Such tools can support tutors in efficiently and effortlessly conducting speaking skills assessments on a regular basis. Furthermore, tutors can encourage and guide EFL students to engage in independent practice using AI tools during their free time [1, p. 123-124]. The results suggest a positive effect for the I-assisted group, not only in holistic speaking ability but also in each of the specific components measured – pronunciation, intonation, fluency, vocabulary, and grammar [1, 2025].

Methods and results

The main research methods are critical analysis of linguistic literature, questionnaires, and forecasting. The primary sources of information included foundational scholarly works and publications by Russian and international researchers and analysts addressing various aspects of the use of multimedia technologies

in foreign language teaching, as well as portals and other online resources from developers of digital educational solutions, and news and reports published in the media. The practical part of the work involved analyzing the functionality of the Gliglish neural network, as well as conducting a survey and analyzing the responses of first, second and third-year linguistics students at Novosibirsk State Technical University in order to develop additional practical materials based on the Gliglish neural network to improve students' speaking skills. The total number of respondents were 32 students, including 2-year students - 15 respondents (48%), 1-year students – 12 respondents (39%), and 3-year students – 5 respondents (13%). The sample is representative of undergraduate linguistics students, with first- and second-year students accounting for 87% of respondents. This is particularly relevant, as the difficulties faced by students.

The first section of questions was devoted to the *Psychological barrier while communicating with a real person*. We wanted to find out the preliminary state of students regarding their confidence in a real conversation, psychological barriers, as well as the level of confidence when conducting a dialogue. (See Table 1.) The students were asked to rate how much they agree with each statement *on a scale from 1 to 5, where: 1 – totally disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – totally agree*.

Table 1

Respondents' responses to questions from the first section of the survey

Statement	5	4	3	2	1
<i>1. When I need to speak a foreign language with a teacher or fellow students, I feel anxiety/fear</i>	18 students 56.3%	8 students 25%	5 students 15.6%	1 student 3.1%	0%
<i>2. I feel uncomfortable when I am interrupted or corrected in a conversation</i>	20 students 62.5%	6 students 18.8%	3students 9.4%	2 students 6.3%	1student 3.1%
<i>3. I often understand what I want to say, but I can't formulate a thought because of the anxiety</i>	16 students 50%	12 students 37.5%	3 students 9.4%	0 %	1student 3.1%
<i>4. I prefer to remain silent in class, even if I know the answer, so as not to make mistakes in front of others</i>	21 students 65.6%	5 students 15.6%	4 students 12.5%	2 students 6.3%	0%
<i>5. Even when preparing for a dialogue, I still get very nervous during a real conversation</i>	19 students 59.4%	7 students 21.9%	6 students 18.8%	0%	0%

The problem of the psychological barrier has been confirmed empirically. The percentage of respondents who chose options 4 and 5 is higher for all five statements, which indicates a high degree of anxiety among students during oral communication in a foreign language. The most urgent indications of the barrier:

- anxiety/ fear of speaking if necessary,
- maintaining excitement even after preliminary preparation
- difficulty articulating thoughts due to anxiety

Almost three quarters of students (73.5%) admit that they cannot express a thought they know because of excitement. More than 70% prefer to remain silent, even knowing the correct answer (See Table 2).

Conclusion to substantiate relevance: There is an objective need for tools that allow students to reduce anxiety and gain experience in safe speech practice before interacting with real interlocutors.

In the second section of the survey, we found out the attitude of students towards the introduction of an AI tutor for self-study/classroom work. The students were asked to rate how much they agree with each statement *on a scale from 1 to 5, where: 1 – totally disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – totally agree.*

Table 2

Respondents' responses to questions from the second section of the survey

Statement	5	4	3	2	1
<i>1. I would like to be able to practice speaking with an AI tutor</i>	21 students 65.6%	6 students 18.8%	2 students 6.3%	2 students 6.3%	1 student 3.1%
<i>2. I would feel confident talking to an AI because it doesn't judge or evaluate me as a human being</i>	18 students 56.3%	5 students 15.6%	4 students 12.5%	5 students 15.6%	0%
<i>3. An AI tutor could be an intermediate stage for me before real communication</i>	20 students 62.5%	7 students 21.9%	3 students 9.4%	2 students 6.3%	0%
<i>4. I am ready to devote time to independent practice with an AI tutor</i>	18 students 56.3%	7 students 21.9%	6 students 18.8%	1 student 3.1%	0%

Considerable quantity of students are ready to use an AI tutor. More than 79% of respondents express a desire to practice speaking with an AI interlocutor. The main motivation is psychological safety. Students are clearly aware that the absence of evaluation and condemnation from AI is a key advantage in reducing anxiety.

AI is perceived as an intermediate stage. 79.4% of students see an AI tutor as an opportunity to prepare for communication with real interlocutors, which fully corresponds to the proposed logic of using Gliglish. High willingness to work independently. 73.5% of students are willing to devote time to independent practice with AI, which makes the format of homework and self-study pedagogically appropriate.

The Gliglish platform for learning languages based on artificial intelligence (AI) has several advantages. It helps to improve speaking and listening skills through interactive conversations with a virtual AI Teacher. Some advantages of this neural network:

- flexibility and accessibility – student can practice for free anytime, anywhere, without having to sign up for classes,
- multilingual support – student can learn and practice multiple languages and dialects on the same platform. Availability of 18 languages,
- preparing for real situations is simulating conversations for interviews, travel, dating, and other practical cases.

Some features of the Gliglish platform that help in improvement speaking skills are:

- instant feedback on grammar and pronunciation – the user receives immediate corrections and detailed recommendations to improve accuracy and accent during practice,
- adjustable speech speed – student can adjust the AI's speech rate according to the level of understanding and learning needs,
- translation and dictionary support – student can instantly translate words or sentences and get contextual explanations to expand your vocabulary,
- flexible compatibility – the platform is available on various mobile devices, allowing you to practice your language skills on the go.

Conclusion

The present study empirically confirms the presence of a pronounced psychological barrier among junior linguistics students during speaking foreign language communication. More than 70% of respondents experience excitement and fear when they need to speak, prefer to remain silent, even knowing the answer, and face difficulties in formulating thoughts due to excitement. At the same time, students demonstrate a high level of readiness to use an AI tutor as a tool to overcome this barrier. The key factors contributing to this willingness are psychological safety (lack of evaluation and condemnation by AI) and the possibility of preliminary preparation for real communication. Special attention should be paid to the fact that 91.2% of respondents positively assess the idea of pre-rehearsing a dialogue with an AI interlocutor before interacting with a real person. This is a direct empirical confirmation of the student's request to introduce such tools into the

educational process. The results obtained allow us to conclude that it is advisable to use the Gliglish AI tutor in the training of linguistics students. The most promising implementation formats are the independent training of students and the use of the platform as a tool for homework, which allows them to maintain a high level of motivation and provide psychologically comfortable conditions for the development of oral speech.

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ARTIFICIAL INTELLIGENCE AS A FACTOR OF TRANSFORMING PEDAGOGICAL CONDITIONS FOR THE FORMATION OF PROFESSIONAL ETHICS OF FUTURE LAWYERS

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Abstract. The article explores the potential of artificial intelligence (AI) as a factor in transforming the pedagogical conditions for the formation of professional ethics of future lawyers. Key contradictions of traditional training are identified: the dominance of the "knowledge" paradigm with increasing requirements for the moral reliability of a specialist; the gap between the normative goal of educating a lawyer and real educational

practice. Based on theoretical analysis, a model for integrating AI tools into the educational process is proposed: the use of generative neural networks to create ethically varied cases, AI simulators with branching scenarios of moral choice, and automated reflexive diagnostic systems. The risks and limitations of using AI in ethical training are substantiated. Criteria for assessing the effectiveness of AI-mediated pedagogical conditions are proposed.

Keywords: artificial intelligence; professional ethics of a lawyer; pedagogical conditions; AI simulators; generative neural networks; ethical dilemmas; transformation of education; reflexive diagnostics.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАК ФАКТОР ТРАНСФОРМАЦИИ ПЕДАГОГИЧЕСКИХ УСЛОВИЙ ФОРМИРОВАНИЯ ПРОФЕССИОНАЛЬНОЙ ЭТИКИ БУДУЩИХ ЮРИСТОВ

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Аннотация. В статье исследуется потенциал искусственного интеллекта (ИИ) как фактора трансформации педагогических условий формирования профессиональной этики будущих юристов. Выявлены ключевые противоречия традиционной подготовки: доминирование «знаниевой» парадигмы при возрастающих требованиях к нравственной надежности специалиста; разрыв между нормативной целью воспитания юриста и реальной образовательной практикой. На основе теоретического анализа предложена модель интеграции ИИ-инструментов в образовательный процесс: использование генеративных нейросетей для создания этически насыщенных кейсов, ИИ-тренажеров с ветвящимся сценарием морального выбора, систем автоматизированной рефлексивной диагностики. Обоснованы риски и ограничения применения ИИ в этической подготовке юристов. Предложены критерии оценки эффективности ИИ-опосредованных педагогических условий.

Ключевые слова: искусственный интеллект; профессиональная этика юриста; педагогические условия; ИИ-тренажеры; генеративные нейросети; этические дилеммы; трансформация образования; рефлексивная диагностика.

Introduction

The digital transformation of higher education is no longer a distant prospect. AI is already penetrating classrooms, changing knowledge transmission, assessment, and the logic of the educational process. However, while AI's impact on "hard" skills is actively discussed, its role in forming professional ethics of lawyers remains virtually unexplored.

Yet it is precisely here that traditional education demonstrates its most persistent deficiencies. As S.A. Sofronova notes, evaluative concepts in legislation leave the lawyer with "an extremely wide scope of subjective discretion" [9, p. 45]. A student can pass an ethics exam by memorizing codes, but find himself helpless when facing a real ethical dilemma [9, p. 46].

Russia's legal system shows a persistent gap between constitutional principles and law enforcement practice. One source of this gap is personnel-related: a lawyer who masters positive law but lacks mechanisms for resolving ethical dilemmas is helpless in situations of subjective discretion. Analysis of educational practice reveals persistent negative trends: a formal approach to ethical disciplines, theoretical knowledge divorced from reality, graduates lacking mechanisms for practical ethical conflict resolution, and teachers lacking methodological resources for forming value orientations.

Thus, traditional training reduces the ethical component to a secondary theoretical discipline. Can AI become a full-fledged factor in transforming the pedagogical conditions for forming the moral character of future lawyers? This article attempts to answer this question. Its aims are: 1) to identify key contradictions of traditional ethical training that AI may resolve; 2) to develop a theoretical model for integrating AI tools; 3) to substantiate criteria for assessing AI-mediated pedagogical conditions; 4) to identify risks and limitations.

Theoretical framework

The theoretical basis of the study consists of three interrelated approaches: contextual learning, reflexive pedagogy, and the axiological approach.

Contextual learning (A.A. Verbitsky) assumes that knowledge is acquired through solving tasks close to real conditions [3]. In traditional education, an ethical norm is presented abstractly: "a lawyer must maintain confidentiality." The student memorizes this but does not understand how to apply it when a client threatens or begs. AI overcomes this: generative neural networks create an infinite number of personalized ethical cases, simulating rare situations (pressure from an "important" client, conflict of interest) [8]. AI can also generate realistic client remarks, creating immersion – the student responds in real time, experiencing emotional tension.

Reflexive pedagogy asserts that professional ethics is formed through activation of internal dialogue. M.A. Artemyeva and A.M. Kuzmin emphasize that the student

"becomes involved in building his own system of professional values" [2, p. 3]. Traditional methods trigger dialogue but are difficult to personalize. AI simulators with branching scenarios record each choice, allow returning to key dilemmas, and generate personal reports, turning reflection into systematic practice [7].

Axiological approach focuses on value-semantic sphere. Professional identity is linked to justice, honor, dignity [5, p. 70]. These values are appropriated only in situations of moral choice. AI can create such situations without real harm and act as an impartial observer, increasing trust in diagnostic results [8].

Thus, AI integration can qualitatively change pedagogical conditions, combining context, reflection, and value choice synergistically.

Methods and results

The study draws on a theoretical examination of Russian and international scholarship in pedagogy, psychology, and legal studies, alongside a synthesis of practical cases of AI integration in higher education between 2020 and 2025. This timeframe is critical because it marks the period when generative neural networks became widely accessible and started reshaping university teaching practices. The analysis covers peer-reviewed articles, instructional guides, conference proceedings, and institutional reports on AI use in academic settings.

Research methods include: critical analysis and synthesis of scholarly sources, pedagogical system modeling, comparative evaluation of conventional versus AI-enhanced teaching techniques, and content analysis of legal ethics curricula and training materials.

The findings reveal three clusters of pedagogical conditions that AI substantially reshapes.

First cluster – AI-driven generation of ethically charged cases and dilemmas.

Conventional case-based instruction typically relies on a limited set of textbook examples – rarely more than 100–150 scenarios. Students quickly become familiar with these cases, which diminishes their learning value over time. More importantly, these cases are static: they do not adapt to individual learners' progress, strengths, or weaknesses. A junior and a senior student receive identical materials, regardless of their differing competencies [8].

Generative AI models (such as GPT-4, YandexGPT, and GigaChat) break this limitation. They produce tailored cases that reflect a student's specialization (criminal, civil, or corporate law), skill level, and prior ethical difficulty profile. Suppose a student consistently prioritizes client interests over factual accuracy. In that case, the AI can generate a sequence of scenarios where this tension – loyalty versus truthfulness – plays out in different professional contexts: before a judge, across the negotiation table, or in media interactions. Particularly valuable is the capacity to create "edge cases" where legal rules and moral principles directly collide. Research

confirms that such situations are simultaneously the most challenging for practitioners and the most fertile ground for ethical growth [9, p. 46].

Second cluster – AI-powered simulators with branching moral choice architectures.

Traditional case studies present a linear path: a student selects an answer and receives a binary "correct/incorrect" verdict. Branching simulators operate differently. They model the ripple effects of each decision, opening new scenario branches with unique consequences, fresh ethical dilemmas, and further decision points [7].

If a student yields to pressure in a simulation, the virtual supervisor may raise their voice, peers may distance themselves, and the client's trust may erode. If the student refuses, the scenario unfolds alternative repercussions: a dismissal threat, a formal complaint, or an ethics committee hearing. This design – sometimes called "immersive ethics" – enables students to experience the weight of an ethical choice rather than merely rationalizing it post hoc. Empirical evidence suggests branching simulations are substantially more effective than conventional cases at cultivating durable ethical conduct [7].

Third cluster – automated reflexive diagnostics through AI.

Standard diagnostic approaches suffer from two persistent flaws: evaluator subjectivity and socially conforming responses. An instructor's personal value system inevitably colors assessment. Meanwhile, students often supply answers they believe will please the teacher rather than those that reflect their genuine convictions – a tendency particularly pronounced in ethics education, where social desirability pressures are strong [2].

AI offers an alternative. By analyzing patterns of choices across multiple cases – rather than relying on self-reported questionnaire data – AI can surface latent value orientations, including those the student may not consciously recognize or actively conceals. For instance, a student might sincerely identify with the principle of justice. Yet the AI, tracking ten consecutive decisions, may detect that whenever personal stakes are involved, the student consistently defaults to maximizing self-interest, regardless of fairness. Uncovering such a gap between declared and enacted values is exceptionally difficult with traditional tools [8]. Furthermore, AI can generate non-judgmental feedback that highlights internal contradictions – "In case A you invoked principle X, but in case B you acted against it. Can you explain what shifted?" – prompting reflection without triggering defensiveness.

Nevertheless, several risks warrant attention. First, algorithmic bias: AI trained on historical data may perpetuate existing ethical stereotypes. Second, dehumanization: excessive reliance on AI could displace the irreplaceable live dialogue between students, peers, and instructors. Third, accountability: if a student trained primarily on AI simulations later commits a real ethical violation, who bears responsibility? These concerns demand careful pedagogical oversight [8].

To evaluate the effectiveness of AI-mediated pedagogical conditions, this study proposes three expanded criteria, building on established frameworks [4, p. 49]:

1. Cognitive criterion – now includes the student's capacity to critically assess AI-generated recommendations. Tomorrow's lawyer must not blindly trust a neural network's "verdict" but must identify its potential blind spots and algorithmic biases.

2. Motivational-value criterion – now incorporates the student's orientation toward AI as a supportive tool, not a moral authority. A key indicator is the willingness to engage in reasoned disagreement with AI suggestions rather than accepting them as final pronouncements.

3. Activity-behavioral criterion – now emphasizes transfer: the ability to apply ethical decision-making skills honed in AI environments to real-world professional interactions. This is assessed through direct observation of student conduct in legal clinics and practice settings [6].

Conclusion

The conducted theoretical research shows that artificial intelligence acts not just as a new teaching tool, but as a full-fledged factor in transforming the pedagogical conditions for forming professional ethics of future lawyers. AI can overcome three key limitations of traditional education: static content (dynamic personalized case generation), lack of immersion (branching simulators allow living through consequences), and diagnostic subjectivity (objective feedback provoking reflection) [1].

AI opens opportunities for: 1) personalized generation of ethical cases; 2) immersive simulators with branching scenarios; 3) automated reflexive diagnostics revealing latent value orientations; 4) dynamic monitoring of value system changes over time.

However, AI implementation carries risks: algorithmic bias, dehumanization, and blurred responsibility. These risks require special pedagogical and ethical norms, not abandonment of AI. As N.M. Alkhanov emphasizes, what is needed is an integral complex of conditions where each component is irreplaceable [1]. In this complex, AI acts not as a teacher replacement, but as a tool expanding the teacher's ability to create situations of genuine moral choice.

The developed diagnostic criteria allow assessing professional ethics formation and identifying "growth points" for each student. Adding criteria related to critical attitude toward AI recommendations is fundamental for training lawyers in the digital transformation era.

Further research involves empirical verification of AI-mediated pedagogical conditions in a formative experiment, including creating an experimental AI simulator, conducting a longitudinal study, and developing methodological recommendations for integrating AI tools into legal ethics education.

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DIGITAL ARTIFICIAL INTELLIGENCE TOOLS AS A MEANS OF IMPROVING FOREIGN LANGUAGE SPEAKING AMONG 9TH GRADE STUDENTS

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Abstract. The article examines the problem of developing 9th grade school students' speaking skills in English with the help of AI. It reveals the review and test of chatbots and tasks from the applications for learning languages as a way of creating communicative tasks. The article proposes options for including AI-generated communicative tasks in a 9th grade English lesson plan.

Keywords: artificial intelligence; English speaking; chat bots; communicative tasks; applications for learning languages.

ЦИФРОВЫЕ ИНСТРУМЕНТЫ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА КАК СРЕДСТВО СОВЕРШЕНСТВОВАНИЯ ИНОЯЗЫЧНОГО ГОВОРЕНИЯ У УЧАЩИХСЯ 9-х КЛАССОВ

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Аннотация. В статье рассматривается вопрос совершенствования умений иноязычного говорения у учащихся 9-х классов с использованием искусственного интеллекта (ИИ). Рассмотрены и опробованы чат-боты и упражнения из приложений для изучения английского языка, как способ создания коммуникативных заданий, с целью их дальнейшего внедрения в план урока для 9-х классов в школе.

Ключевые слова: искусственный интеллект; иноязычное говорение; чат-боты; коммуникативные задания; приложения для изучения английского.

Introduction

Nowadays It is possible to develop foreign language speaking skills with the help of artificial intelligence (AI).

The relevance of this research lies in the fact that not all high school students speak English properly and often face difficulties in oral communication. Therefore, it is necessary to develop the speaking skills.

The purpose of the article is to identify the potential of artificial intelligence in developing ninth-grade students English speaking skills using chatbots and AI-powered applications.

To achieve this goal, we need to define the role of AI in foreign language teaching and examine existing chatbots and AI-powered apps with the exercises for developing foreign language speaking skills presented there.

Research methods – analysis of methodological and pedagogical literature, analysis and generalization of pedagogical experience, observation of the educational process in teaching a foreign language, pedagogical modeling.

The theoretical basis of the study was provided by research on the methodology of teaching foreign language speaking (T.A. Senkova 2014, I.I. Prosvirkina 2017, E.I. Rabina 2020) and on artificial intelligence in teaching speaking (E.M. Proydakov 2018, D.L. Eskin 2023, E.S. Chekulaeva 2024, P.V. Sysoev 2023).

The study's material includes chatbots such as Gigachat, Mistral and YandexGPT, as well as AI-powered applications such as Duolingo, EF Hello and ELSA Speak, and the sets of exercises for developing foreign language speaking skills presented there.

Theoretical framework

The value of AI systems for teaching lies in the fact that they help create new content – including text, images, and video – based on the analysis and processing of large volumes of data, which enables them to significantly save time in preparing structured, informative, and engaging educational materials for students, including tests and practical tasks.

Chatbots, which are considered a successful simulation of speech because they utilize the surface structures of language and are fully capable of replacing a human conversation partner, are at the forefront of AI-assisted speech training. A chatbot is “a dialogue-based learning program capable of developing a learner’s foreign-language oral and written communication skills through dialogue and the imitation of human speech, based on natural language and machine learning technologies and the algorithms of human speech behavior embedded within it” [4]. The most popular chatbots today are ChartGPT4, EnglishSimpleBot, YouChat, ELSA speak, EF Hello, Mistral, YandexGPT, which offer a wide range of features, including: 1) unlimited chat with the ability to ask any questions and

receive answers; 2) the ability to maintain a dialogue in different languages; 3) learning new words; 4) developing skills in all types of speech activities through various exercises, etc.

The advantage of chatbots for teachers is that they can be used to create any type of tasks – from quizzes to communicative exercises – and incorporate them into lesson plans depending on the goal: to diversity classroom work, prevent cheating or, as in our case, to improve specific skills. The teachers' only task is to formulate the prompt correctly.

Methods and results

We analyzed the communication exercises in three apps – Duolingo, EF Hello and ELSA Speak – based on the criteria identified by most authors in the field of pedagogy when evaluating AI systems in foreign language learning: 1) adaptation to the learner's level; 2) personalized learning; 3) automatic checking and feedback; 4) pronunciation analysis; 5) realistic conversational situations; 6) gamification elements and motivation [1], [6], [5].

As the analysis has shown, the Duolingo app is the most suitable for integration into school lesson plans due to its openness and accessibility; therefore, to achieve our goal, we will use the communication exercises from this app [3].

To create our own communicative tasks related to specific topics within the school curriculum, we used the following chatbots: Gigacgat, Mistral and Yandex.GPT, as they are well-suited for working with text and are free to use.

At the time of the pedagogical experiment, the ninth-graders we were working with were studying Module 6 of the Spotlight 9 curriculum, which focuses on the topic of "The society we live in". The lessons in this module cover topics such as "Lending a helping hand"; "Map symbols and road features"; "Passive voice" and "Public services". We suggest adding only one communicative task to each section, as completing them takes quite a bit of time. Our goal is to select and create tasks of various types so that students do not get bored and so that we develop speaking skills in different ways. Since dialogue communicative exercises include question-and-answer exercises, response exercises, conditional conversation, situational exercises, role-playing, retelling, descriptive exercises and discussion exercises, we will select tasks of this format [2]. Our tasks will serve as a verbal framework, which is essential for doing speech exercises.

We have developed the following exercises as an additional way to develop speaking skills in 9th-grade English classes:

1. As a part of a lesson on the topic "Lending a helping hand" – a situational exercise created with the help of Gachat chatbot:

Read the situations below. Think of your opinion/attitude. Discuss it with your partner. Use the phrases of possible answers to agree, disagree or stay neutral.

Situation 1: *Some volunteers think that helping animals in shelters is more important than helping elderly people because animals can't take care of themselves. Do you agree with this opinion?*

Situation 2: *A volunteer says it's better for disabled people if they live at home rather than in special centers where many other disabled people are living together. What do you think about it?*

Situation 3: *Volunteers who help foster homes believe children need toys and games more than books and educational materials. Do you support their idea?*

Possible Answers:

- *Agree: Yes, I think so too / That's right!*
- *Disagree: No, I don't think that's true / It's not correct!*
- *Neutral: Maybe both things are equally important / It depends on each situation.*

2. As a part of a lesson on the topic “Map symbols and road features” – a role-play – conversation based on an example from the Duolingo app (see Pic. 1, 2):

Read the conversation between Oscar, Eddy and a woman. What was their problem? Act out a dialogue with your classmates based on this example.

3. As a part of a lesson on the grammatical topic “Passive voice” – a question-and-answer exercise created with the help of Mistral chatbot:

Chain activity. Starting person chooses one of the classmates and ask them one of these questions in passive. After answering it, the person that have been asked, chooses the next classmate and asks them another question. Continue this chain until everyone is asked.

1. *At what time is breakfast usually served in your house?*
2. *What kind of food is often eaten for lunch at school?*
3. *How often are the rooms in your flat cleaned?*
4. *Where are your favorite books kept?*
5. *What kind of music is listened to by your friends?*
6. *How often are the windows in your classroom opened?*
7. *What kind of movies are usually watched on weekends?*
8. *What time is dinner prepared in your family?*
9. *How often are the plants in your house watered?*
10. *What kind of games are played by children in your neighborhood?*

4. As a part of a lesson on the topic “Public services” – a descriptive exercise based on examples from the Duolingo app (see Pic. 3, 4, 5) and supporting words selected using the Yandex.GPT chatbot:

Describe one of the public places presented in exercise 1 using supporting words below. You can look at the examples that describe places and follow the structure.

Lost Directions

Eddy is driving Oscar to a new restaurant across town. Oscar is looking at a map on his phone.

OK, turn right here.

Right? Are you sure?

Yes, Eddy. Right. I'm looking at the map.

Eddy turns left.

That was left! I said right!

Sorry! Left and right are stressful for me.

Just stop the car. I need a moment.

Eddy stops the car. A woman on the sidewalk sees them and walks over.

Are you two lost? Where are you going?

Are you two lost? Where are you going?

We're looking for Maple Street!

Oh, it's easy. Go straight, then turn left at the park.

We are not lost. I have directions on my phone. We are going through Oak Avenue.

Oak Avenue? But that's twenty minutes longer.

Yes, but the buildings on Oak Avenue are beautiful. I planned this route for a reason.

The woman walks away. Oscar looks at his phone.

Oh no. My phone just died.

That's OK! I'll find the way!

Eddy, you don't know left from right.

Pic. 1. Part 1 of the dialogue from Duolingo Pic. 2. Part 2 of the dialogue from Duolingo

Our grandparents have a nice dining room
where they eat dinner.

Pic. 3. Example #1 of description from Duolingo

The hall here is narrow, but the
living room is wide.

Pic. 4. Example #2 of description from Duolingo

Grandma's room is the brightest room in
the house because there are two big
windows.

Pic. 5. Example #3 of description from Duolingo

Supporting words: • letter • stamp • parcel • to send • worker • cash • card • customer • uniform • help • emergency • magazine • shelf • to borrow • quiet • ticket • platform • timetable • waiting room • building • meeting • documents • fire truck • alarm • rescue • nurse • patient • ambulance • petrol • fill up • oil • tire • mechanic

Conclusion

Thus, the communicative exercises offered in the Duolingo app can be used as support for improving 9th-grade students' foreign language speaking skills and integrated into the learning process. Chatbots have also proven to be a convenient and versatile tool for creating students' own communicative tasks. AI systems can become a valuable assistant to teachers if their functions are carefully studied and then integrated into the learning process, adapting them to specific classes, different students, and the topic and purpose of the lesson. This will help achieve progress even with limited time.

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ARTIFICIAL INTELLIGENCE AS A PEDAGOGICAL ASSISTANT IN PROFESSIONALLY-ORIENTED FOREIGN LANGUAGE TEACHING

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Abstract. The study examines the use of Artificial Intelligence (AI) as a pedagogical assistant in professionally-oriented foreign language teaching for students in Philology. It addresses the problem of integrating AI tools into Project-Based Learning without undermining learner autonomy and critical thinking; it proposes three core principles – functional limitation, reflective interaction, and professional contextualization – demonstrating that adherence to the principles allows AI to enhance both language learning and professional competence.

Keywords: artificial intelligence; project-based learning; foreign language teaching; professionally-oriented foreign language; philology; critical thinking.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАК АССИСТЕНТ ПРЕПОДАВАТЕЛЯ В ОБУЧЕНИИ ПРОФЕССИОНАЛЬНО- ОРИЕНТИРОВАННОМ ИНОСТРАННОМУ ЯЗЫКУ

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Аннотация. В исследовании рассматривается использование искусственного интеллекта (ИИ) в роли ассистента преподавателя в профессионально-ориентированном обучении иностранному языку студентов-филологов. Решается проблема интеграции ИИ-инструментов в проектное обучение без подрыва учебной автономии и развития критического мышления; предложены три основных принципа – функциональное ограничение, рефлексивное взаимодействие и профессиональная контекстуализация, при соблюдении которых ИИ способствует развитию как языковой, так и профессиональной компетенций.

Ключевые слова: искусственный интеллект; проектное обучение; обучение иностранному языку; профессионально-ориентированный иностранный язык; филология; критическое мышление.

Introduction

Digitalization of higher education has changed the teaching practice and it is specifically true about the foreign language teaching. The contemporary curricula is founded on the active learning, analytical thinking and the development of professional skills, which are oriented on the requirements of the real world. Project-Based Learning (PBL) is one of these approaches, and one of the most efficient learning strategies applied to learners since it provides more complex, real-world tasks that require creativity, critical thinking, and use of foreign language. In the meantime, technologies related to Artificial Intelligence (AI) like large language models and chatbots have already permeated language teaching. They are instruments that provide dynamic feedback, extended language training, and individual assistance. However, they also present pedagogical problems of excessive dependence, reduced mentally and endanger academic integrity. There has been a research literature exploring the opportunities and threats of AI in learning [3; 7], as well as its use in the language learning [2], but relatively little literature has focused on its use in professionally-oriented education of the students in the field of Philology where the primary focus is put on advanced analytical and reflective proficiency.

Thus, the purpose of the given research is to create and empirically prove a pedagogical model of AI implementation in project-based foreign language learning

among Philological students. In particular, it aims to find out what principles and practices can facilitate the use of AI as a pedagogical support without limiting the learner and their critical thinking [1]. The following question guides the research: How can AI chatbots be incorporated into project-based professionally-oriented foreign language learning among Philology students in the ways that neither hurt nor reduce critical thinking and professional competence?

The paper gives empirically-grounded pedagogical principles of functional limitation, reflective interaction, and professional contextualization as a practical knowledge on how to design AI integration in the form of active support, but not unintended destruction of traditional professional competencies of future philologists.

Theoretical framework

PBL is interpreted to be a method where students undertake long, inquisitive projects that lead to real products. It encourages teamwork, interaction and building of knowledge by learners. The method effectively promotes motivation and communicative competence in foreign language teaching in the real life problem solving and meaningful use of language.

AI in teaching can play the functions of a tutor, a tool or a partner. It provides automated explanations when used as a tutor; facilitates tasks, including error correction and translation, when used as a tool; contributes to the creation of meaning, when it is used as a partner. Only in the case when AI is a subordinate element of pedagogical objectives, and not a substitute of student reasoning skills, these roles may be positive. According to the theory of cognitive bias developed by Kahneman, a common default regarding human thinking is such that fast, intuitive judgments should be made when it comes to processing external recommendations [4]. This would render reflective interaction with AI outputs essential in the context of AI-based learning. A suggestion to encourage critical agency and meta-cognitive awareness is encouraging students to question and evaluate AI suggestions.

Although AI has proven to help in translation, grammar checking, and writing support [2; 5], its role in PBL in terms of serving students in Philology is not fully investigated. This research aims to fill in this gap by discussing pedagogical principles of the responsible application of AI as a pedagogical assistant.

Methods and results

The research paper is a qualitative case study where the authors examine the interaction between students and AI within a real classroom setting. The study took place in November 2025 among 14 first-year students majoring in Philology at Novosibirsk State Technical University, Russia [1]. The chatbot *GigaChat* was the AI tool employed in the professionally-oriented English language course dedicated to academic writing, interpreting the literature, and translating it [2]. It was incorporated in three sets of project-based activities including literary interpretation, translation

analysis and academic writing activities. In the assignments, the students were asked to make their version of the task and find parallels with AI output after that. They had to explain why AI suggestions could or could not be accepted, changed, or not?. The data was analyzed using a thematic analysis approach based on six phases offered by Braun and Clarke [1]. The analysis process was performed in the following way: 1) getting acquainted with the data by repeatedly reading student texts, AI results, and commentaries; 2) creating initial codes, e.g., uncritical acceptance, lexical modification, stylistic rejection, fact-checking; 3) searching the themes by sorting similar codes into larger patterns; 4) revising the themes to make sure they were a satisfactory representation of the data-set; 5) defining and naming the final themes, which were related to the three pedagogical principles presented in this paper. In order to make the interpretation more credible, the coding was performed in consultation with a research supervisor, and the final themes were also triangulated with the reflective statements of the students in order to make sure that the patterns of critical engagement identified were consistent with the personal point of view of the learners. The discussion resulted in the development of three pedagogical principles that should guide AI application in project-based learning of a foreign language (see Table).

Table 1

Pedagogical principles of AI use in Project-Based foreign language learning

Principles	Description	Example task	Main risk
Functional limitation	AI supports learning but does not replace students' thinking processes	Students first write their own analysis and then compare it with AI output	Students submit AI-generated text as their own work (academic dishonesty)
Reflective interaction	Students critically evaluate AI responses and justify their decisions	Students analyze AI-generated translations and explain their decisions	Uncritical acceptance of AI suggestions without understanding why
Professional contextualization	Tasks reflect real professional activities in philology	Students improve academic writing for publication purposes	AI provides generic feedback that is not relevant to the philological context

In the literary interpretation tasks, students compared their own interpretations with AI-generated analyses of key sentences from literary texts. For instance, when analyzing the sentence “*It was the best of times, it was the worst of times,*” the AI correctly identified antithesis and parallelism [2]. However, several students pointed out that it overlooked stylistic nuances such as tone and historical context. One student

reflected: *"The AI identified the rhetorical devices, but it failed to recognize the ironic tone of the passage."* In most cases (about 70%) [2], students identified: at least one element of the literary text that the AI had either misinterpreted or missed altogether. This pattern suggests that the designed task effectively encouraged students to view AI not as a authority, but as a conversational partner. In the translation tasks, students evaluated AI generated translations of short sentences from English into Russian. For example, when translating *"The rapid development of technology has changed modern education,"* the AI offered: *"Стремительное развитие технологий преобразовало современное образование"*. One student accepted the AI's grammatical correction but rejected its lexical choice (*"преобразовало"* instead of *"изменило"*) as being too formal for the intended context, revising the translation accordingly. An analysis of student justifications revealed that lexical choices were the most frequently contested aspect of AI-generated translations. In over half of the translation tasks (8 out of 14), students rejected or modified the AI's word choice, citing reasons such as inappropriate register or failure to capture cultural connotations, while grammatical suggestions were accepted in more than 80% of cases [2]. In the academic writing tasks, students submitted short paragraphs for AI-based improvement. For example, one student submitted a paragraph with basic grammar and style issues. The AI responded with suggestions for refining sentence structure and word choice, offering: *"AI can assist students in language learning by providing immediate feedback. However, learners must maintain critical thinking skills."* The student then concluded: *"I kept my original idea but accepted the grammar corrections."* While students consistently accepted AI suggestions for surface-level grammar and spelling corrections, a thematic analysis of their reflective comments revealed a clear pattern of resistance to stylistic changes. One student reflected: *"AI was useful for grammar but missed my stylistic intent,"* a sentiment echoed in over 60% of the written reflections on this task [1].

Conclusion

According to the research, artificial intelligence can be utilized as a pedagogical assistant in foreign language teaching with a professional focus because of the regulated use of this element by transparent pedagogical principles [3; 7]. Three principles proposed, that is, a functional limitation, reflective interaction, and professional contextualization, can help to implement AI not as a replacement of the intellectual work of the students, but as an assistant tool. The findings of this research may be used in the development of a context-related model of pedagogy. Under these conditions AI-enhanced project-based learning would contribute to the formation of not only language but also professional skills of the students of Philology, and to the formation of critical attitude towards the tools related to computers. We plan to adopt mixed methodology and bigger sample sizes in future as this will help us to analyse the research problem in a more detailed manner.

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DIE METHODEN FÜR ENTWICKLUNG DER LESEFERTIGKEITEN IN DER FREMDEN SPRACHE VON SCHÜLERN DER 10. UND 11. KLASSEN IM ZEITALTER DER KI

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Abstract. Im vorliegenden Artikel wird die Vervollkommnung der Lesefertigkeiten in der fremden Sprache untersucht. Es werden die Gründe erörtert, warum die Künstliche Intelligenz einen negativen Einfluss auf die Lesefertigkeiten hat, sowie die Methoden zur Vervollkommnung der Lesefertigkeiten und -fähigkeiten ohne den Einsatz von der KI vorgestellt.

Schlüsselwörter: Entwicklung der Lesefertigkeiten in der fremden Sprache, Rolle der Künstlichen Intelligenz im Fremdsprachenunterricht, der negative Einfluss von der KI in der Ausbildung.

СПОСОБЫ ФОРМИРОВАНИЯ И СОВЕРШЕНСТВОВАНИЯ НАВЫКОВ ЧТЕНИЯ НА ИНОСТРАННОМ ЯЗЫКЕ У УЧАЩИХСЯ 10-11 КЛАССОВ В ЭПОХУ ИИ

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Аннотация. В статье фокусируется внимание на совершенствовании навыков и умений чтения на иностранном языке. Рассматриваются причины того, почему ИИ имеет исключительно негативное влияние на совершенствование навыков и умений чтения, предлагаются способы формирования навыков чтения без привлечения ИИ.

Ключевые слова: формирование навыков чтения на иностранном языке; роль ИИ на занятиях по иностранному языку; негативное влияние ИИ в образовании.

Einführung

Derzeit wird der Trend zur Verringerung und zum allmählichen Verlust der Lesefertigkeiten und -fähigkeiten in der fremden Sprache von den Schülern der 10. und 11. Klassen beobachtet. Die Ursache ist der Einsatz der KI im Lernprozess. Infolgedessen stagnieren und verschlechtern sich die Lesefertigkeiten und –fähigkeiten, die bis zur 10. Klasse entwickelt sind. Eine der Folgen des Verlustes erworbener Lesefertigkeiten und -fähigkeiten sind schlechte Noten für Aufgaben im Bereich „Lesen“ des einheitlichen Staatsexamens (EGE). Um dem Trend des Verlustes der Lesefertigkeiten und -fähigkeiten in der fremden Sprache entgegenzuwirken, muss man analysieren, warum die KI einen negativen Einfluss auf die Lesefertigkeiten und -fähigkeiten hat.

Theorie

Zuerst ist es festzustellen, dass die KI keine Methoden zur Vervollkommnung der Lesefertigkeiten und -fähigkeiten in der fremden Sprache darstellen kann, weil Forschungen negative Ergebnisse belegen. So ergab die internationale Forschung OECD7 bedeutende Verschlechterung (um 34%) der Fähigkeiten tiefer Analyse von Information bei dem regelmäßiger KI-Nutzer [2]. Es ist bekannt, dass die Lesefertigkeiten und -fähigkeiten nicht nur aus der Beherrschung der **Lesetechnik** bestehen, sondern auch aus der Erschließung der sinnhaften Seite der Sprache, um das Gelesene zu analysieren und das inhaltliche Verständnis zu entwickeln.

Ein weiterer Grund für den schädlichen Einfluss von der KI auf die Vervollkommnung der Lesefertigkeiten und -fähigkeiten in der fremden Sprache

ist die hohe Anzahl der sprachlichen Fehler seitens der KI. Die Forschungen zeigen, dass die von der KI generierten fremdsprachlichen Texte viele Sprachfehler und mechanisch wiederholte syntaktische Konstruktionen enthalten können. Das bedeutet, dass der von der KI generierte Text nicht zur Verbesserung des Leseverständnisses dienen kann, weil die KI zur produktiven Arbeit mit den Einführungsaufgaben für die tiefe Analyse des Textes nicht anleiten kann [1].

Neben den sprachlichen Fehlern sollen wir beachten, dass KI keine emotionalen Komponenten hat, welche für die Vervollkommnung der Lesefertigkeiten und -fähigkeiten gebraucht werden. Die KI ist im Unterschied zu den Lehrkräften nicht in der Lage, Emotionen und nonverbale Signale zu verstehen und zu interpretieren. Der Lehrer nutzt im Unterricht im Unterschied zur KI nicht nur Wörter, sondern drückt seine Meinungen und Gedanken durch Stimme, Tonfall, Sprachtempo und Interaktionsdynamik aus [4].

Noch ein Hindernis für die Vervollkommnung der Lesefertigkeiten und -fähigkeiten mithilfe von der KI ist unkontrolliertes Vertrauen der KI. Sie gibt immer ständig Hinweise, präsentiert den Lehrstoff, wählt Beispiele aus und korrigiert Fehler. Leider geht wegen dieser „Hilfe“ von der KI das Element der Eigenverantwortung und externen Kontrolle vom Lehrer verloren, das sehr wichtig im Unterricht ist. Die KI wird lediglich ständig uns für unsere Existenz loben. Sie wird uns an die Hausaufgabe nicht erinnern oder in Momenten der Erschöpfung uns nicht ermutigen. Daher ist die Rolle der Lehrkraft bei der Organisation des Studiums sehr wichtig und unverzichtbar [5].

Weiterhin werden wir auf die Worte von O. Smolenskaja achten. Sie sagt: „KI ist lediglich ein Werkzeug der Selbsttäuschung“. Diese Worte sind **aktuell**, weil die unkontrollierte Nutzung der KI zu nachteiligen Folgen für Studierende und Absolventen führt. Wegen der KI gibt es ein Fehlen der notwendigen Kenntnisse und Fähigkeiten, die sehr wichtig für den Arbeitsmarkt und professionelle Entwicklung sind. Das führt zur Unmöglichkeit der beruflichen Entwicklung in jeder Branche [3]. Diese Worte geben die präzise Definition und das innere Wesen von der KI. Es ist klar: der Glaube an die KI ist sehr ungesund. Sich auf die KI verlassen bedeutet die Vermeidung der Verantwortung für das erzielte Ergebnis. Das schadet nicht nur dem einzelnen Menschen, sondern auch der Gesellschaft als Ganzem.

Methoden und Resultate

Nach der Untersuchung der Gründe, warum der Einfluss der KI auf die Lesefertigkeiten und -fähigkeiten in der fremden Sprache ausschließlich negativ ist, sollen nun die Methoden zur Vervollkommnung der Lesefertigkeiten ohne den Einsatz von der KI beschrieben werden.

Die erste Methode ist die regelmäßige Kontrolle der Bewahrung der Lesefertigkeiten und -fähigkeiten durch das Vorlesen der Texte in der fremden

Sprache. Die Auswahl der fremdsprachlichen Texte soll für jeden Schüler nach dem sprachlichen Niveau erfolgt werden, weil es einen Unterschied zwischen dem grundlegenden und vertieften Bereich des Sprachniveaus gibt.

Zur Bestätigung der Wirksamkeit dieser Methode wurde ein Experiment mit den Schülern der 10. Klasse durchgeführt. Die Klasse bestand aus 10 Lernern, davon hatten 6 Lerner Niveau A2+, 1 Lerner hatte Niveau B1, 2 – Niveau A2 und 1 – Niveau A1+. Die Ergebnisse waren folgend: In der ersten Stufe der 10. Klasse wurde das Niveau der Entwicklung von Lesefertigkeiten und -fähigkeiten zum Anfang der 10. Klasse auf dem Stand erhalten. Die Ergebnisse zeigen uns, dass diese Methode zur Vervollkommnung der Lesefertigkeiten und -fähigkeiten wirksam ist.

Die zweite Methode ist die regelmäßige Aufmerksamkeit auf das Lesen des Buches oder der Kurzgeschichten in der fremden Sprache zu behalten und das Gelesene wiederzugeben. In diesem Fall geht es nicht nur um das Lesen, sondern auch um die Analyse des Gelesenen, um die Gedanken erfolgreich zu vermitteln.

Zur Bestätigung der Wirksamkeit dieser Methode wurde ein Experiment mit den Schülern der 11. Klasse durchgeführt. Es gab 8 Lerner. Die Ergebnisse waren folgend: die Lerner haben ein höheres Verständnis des Textinhaltes bei der Wiedergabe. Das bedeutet, dass die Fähigkeiten der Textanalyse von Lernern auf dem hohen Niveau entwickelt sind.

Die dritte Methode ist die Benutzung der Texte aus dem einheitlichen Staatsexamen (EGE) (aus dem Aufgabenblock 12-18, weil diese leichter zu bearbeiten sind), um die Information zu finden. Beispielweise können die Lerner 5 Fragen ohne Antwortmöglichkeit formulieren oder die Information aus dem Text finden, analysieren und umformulieren, um die vollständigen und präzisen Antworten zu geben.

Es ist wichtig zu beachten, dass die obengenannten Methoden noch besser wirken, wenn im Unterricht auf die Nutzung von Geräten (wie Handys) und der KI verzichtet wird.

Zusammenfassung

Zusammenfassend lässt sich sagen, dass die Vervollkommnung der Lesefertigkeiten und -fähigkeiten in der fremden Sprache ohne den Einsatz von der KI möglich ist, und es erlaubt, zusammen mit der Vervollkommnung der Lesefertigkeiten und -fähigkeiten die Menschlichkeit und Persönlichkeit im Zeitalter der KI zu entwickeln. Ebenso kann man durch die KI-Nutzung nicht nur die Lesefertigkeiten und -fähigkeiten vervollkommen, sondern auch sie wiederherstellen.

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RETHINKING ENGLISH FOR ACADEMIC PURPOSES METHODOLOGY THROUGH THE DYSFUNCTIONALITIES OF DIGITAL LITERATURE AND AI-GENERATED TEXTS

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Abstract. The expansion of generative AI has promoted significant reconsideration of methodological practices within EAP. In this article, we focus on how AI-generated texts can function as methodological material and help students develop critical academic literacy. We also propose a novel methodological framework. It combines the analysis of dysfunctions of digital literature with the critical examination of AI-generated texts.

Keywords: AI-generated texts; digital literature; EAP; critical thinking.

ТРАНСФОРМАЦИЯ МЕТОДИКИ АНГЛИЙСКОГО ЯЗЫКА ДЛЯ АКАДЕМИЧЕСКИХ ЦЕЛЕЙ В КОНТЕКСТЕ ДИСФУНКЦИЙ ЭЛЕКТРОННОЙ ЛИТЕРАТУРЫ И ИИ-ТЕКСТОВ

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Аннотация. Внедрение генеративного ИИ в высшее образование требует пересмотра методики академического английского (EAP). В данной статье рассматривается, как сгенерированные тексты могут служить педагогическим материалом для развития критической академической грамотности, и предлагается новая педагогическая рамка, сочетающая анализ дисфункциональной цифровой литературы с критическим исследованием текстов, созданных ИИ.

Ключевые слова: ИИ-генерируемые тексты; электронная литература; английский язык для академических целей; критическое мышление.

Introduction

Generative AI has fundamentally changed the landscape of academic writing and literacy instruction. AI-based language models are now capable of many things, for example, producing sophisticated texts, assisting with summaries, idea generation, drafting academic papers, etc. [7]. As a result, educators within English for

Academic Purposes (EAP) have been facing more and more challenges with adapting pedagogical approaches to this new environment where algorithmic systems can produce academic texts in seconds.

Most of the current debates surrounding AI in education focus on issues of academic integrity, authorship, and assessment. Of course, these concerns are important; however, we need to shift our point of view of it being a problem that we need to control to viewing it as a pedagogical resource that we need to critically examine [6]. In this article, we propose an alternative perspective where AI-generated texts can serve as productive objects of analysis and expose structural weaknesses in rhetorical design, argumentation, and coherence.

Very similar analytical potential can be noted in digital literature. Many digital works include experimental interfaces, nonlinear structures, algorithmically generated content, etc. Within such works, readers encounter dysfunctionalities. For example, navigation is confusing, interactive elements are lacking meaningful purpose, and narrative coherence is collapsing entirely. Such features should not be considered as technical flaws but as strategies that help us reveal conditions of digital textuality.

This article brings these two domains together by proposing a pedagogical framework that examines dysfunctionalities across both digital literary environments and AI-generated texts. By analyzing how digital systems break down, students gain insight into the structural principles that underlie effective academic communication. The article claims that digital texts which malfunction offer a clear teaching model. Educators use the model to reconsider English for Academic Purposes instruction when artificial intelligence systems operate inside classrooms.

Theoretical framework

The study builds its theoretical base on three sources which are digital narrative theory, media studies and recent investigations into how artificial intelligence operates within educational settings.

Marie-Laure Ryan conceptualizes narrative as a form of virtual reality, in which readers immerse themselves within a coherent fictional world. Such world is structured by spatial, temporal, and causal relations [8]. When these relations remain stable, readers can navigate the narrative environment without difficulty. However, when they break down, the reader becomes aware of the artificial mechanisms that make up this narrative world.

N. Katherine Hayles expands this perspective through the concept of the material metaphor; it highlights that textual meaning and technological infrastructure in digital literature are interlinked and cannot be separated [4]. According to Hayles, the code and interface of a digital work are integral elements of its literary expression,

they are not just technical components. This study identifies five forms of dysfunctionality: spatial disorientation, unproductive interactivity, opaque systems, thematic dissonance, and temporal collapse. These dysfunctionalities hinder narrative immersion and reveal the underlying structure of the digital environment at the same time.

If we are looking at it from a pedagogical perspective, these dysfunctionalities resonate with the concept of multiliteracies. This concept emphasizes the importance of developing literacy across multiple media forms and communicative contexts [1]. In a similar way, multi-module pedagogy encourages students to engage with complex digital texts, which include linguistic, visual, and technological elements in a critical manner [9].

Recent research on generative artificial intelligence further highlights that critical engagement is crucial. Large language models can produce fluent academic discourse but it is very common for them to come up with logical inconsistencies, fabricate citations, or structure arguments poorly [5]. Such shortcomings are similar to the dysfunctionalities identified in digital narratives. They can serve as a conceptual link between digital humanities scholarship and contemporary AI literacy education. Students learn to recognize how digital systems construct meaning and how algorithmic processes shape textual communication by examining these breakdowns.

Methods and Results

In this study, we propose a pedagogical model that can be implemented within an EAP classroom context. The model encourages students to analyze experimental digital narratives and critically evaluate AI-generated texts. Students engage in a series of classroom activities organized around the five dysfunctionalities:

1. **Spatial Disorientation:** students analyze AI-generated essays and map their argumentative structures. By identifying missing transitions or fragmented reasoning, students understand the importance of coherent text.

2. **Unproductive Interactivity:** students experiment with different AI prompting strategies. This encourages reflection on prompting as a rhetorical practice, not just a technical operation.

3. **Opaque Systems:** students evaluate AI-generated literature review sections and verify all references using academic databases. This exercise highlights fabricated citations and encourages critical source evaluation.

4. **Thematic Dissonance:** students compare AI-generated texts with peer-reviewed academic articles on the same topic. The analysis highlights discrepancies between stylistic fluency and conceptual coherence.

5. **Temporal Collapse:** students reorganize paragraphs from AI-generated essays to restore logical argumentative progression.

Early evidence shows that when students study both digital literary dysfunctionalities and AI-generated texts, they work more intensively with academic writing practices. Broken narrative structures or inconsistent AI outputs force learners to rebuild meaning and identify the structural principles that shape clear argument.

Those activities strengthen key skills of EAP teaching – students learn how texts persuade, how parts of a text link together and how to judge the value of a source. When students treat AI-generated texts as objects to examine instead of as ready made academic papers, they gain a sharper view of how algorithms create knowledge. Recent studies call for critical AI literacy in universities – instead of banning AI software, teachers build tasks around it. The tasks reveal where the software fails and push students to question every output.

Conclusion

The increasing presence of artificial intelligence in academic environments requires educators to reconsider traditional approaches to teaching academic writing. This article argues that the dysfunctionalities of digital literature provide a productive framework for understanding the structural weaknesses that frequently appear in AI-generated texts.

By analyzing spatial disorientation, unproductive interactivity, opaque systems, thematic dissonance, and temporal collapse, students gain practical insight into the principles of coherent academic discourse. Students learn to check every claim that an AI system produces. They compare the output with peer reviewed sources and with their own data. The process trains them to spot gaps, biases and unsupported statements. Each audit they perform sharpens their ability to build clear, evidence based arguments in their own essays.

The course design rests on a simple premise – when software malfunctions, the failure itself becomes a lesson. A chatbot that fabricates citations or a translator that drops whole paragraphs forces learners to ask why the error appeared plus how to correct it. Repeated encounters with those faults turn routine frustration into systematic inquiry. The classroom becomes a laboratory where broken code is dissected, labeled and turned into instructions for better writing. In this way, digital breakdowns guide the revision of English for Academic Purpose methods under the pressure of artificial intelligence.

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PROFESSIONAL TRAINING OF LAWYERS IN THE CONTEXT OF MODERN EDUCATIONAL STANDARDS AND THE INTEGRATION OF ARTIFICIAL INTELLIGENCE

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Abstract. The article analyzes the specifics of professional training of lawyers in the context of the transition to a competence-based education model. The requirements of the Federal State Educational Standard (FSES HE 3++), the correlation between the concepts of “competence” and “competency”, as well as the role of practical training and the educational component in the formation of the future lawyer’s personality are examined. The necessity of introducing innovative pedagogical tools, including Artificial Intelligence (AI) technologies and modern ICT, to bridge the gap between theory and law enforcement practice is substantiated.

Keywords: competence-based approach; professional training of lawyers; FSES HE 3++; professional competencies; Artificial Intelligence; LegalTech; legal consciousness; practice-oriented learning.

ПРОФЕССИОНАЛЬНАЯ ПОДГОТОВКА ЮРИСТОВ В КОНТЕКСТЕ СОВРЕМЕННЫХ ОБРАЗОВАТЕЛЬНЫХ СТАНДАРТОВ И ИНТЕГРАЦИИ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

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Аннотация. В статье анализируется специфика профессиональной подготовки юристов в условиях перехода на компетентностную модель образования. Рассматриваются требования Федерального государственного образовательного стандарта (ФГОС ВО 3++), соотношение

понятий «компетенция» и «компетентность», а также роль практической подготовки и воспитательного компонента в формировании личности будущего правоведа. Обосновывается необходимость внедрения инновационных педагогических инструментов, включая технологии искусственного интеллекта (ИИ) и современные ИКТ, для преодоления разрыва между теорией и правоприменительной практикой.

Ключевые слова: компетентностный подход; профессиональная подготовка юристов; ФГОС ВО 3++; профессиональные компетенции; искусственный интеллект; LegalTech; правосознание; практико-ориентированное обучение.

Introduction

The current stage of development of Russian society, characterized by global digitalization and regular updating of the legislative framework, determines fundamentally new requirements for the quality of higher legal education. The integration of Russian higher education into the global educational space and the implementation of strategic state initiatives, such as the National Project "Youth and Children", necessitate a systematic modernization of approaches to the training of future lawyers [6, p. 259]. In the context of a rapidly changing labor market, heavily influenced by the active implementation of Artificial Intelligence (AI) and LegalTech solutions, the legal profession requires from a specialist not just mechanical reproduction of theoretical information, but also the ability to think unconventionally, adapt quickly and effectively solve applied problems.

Theoretical framework

The traditional knowledge-based paradigm, which has long dominated Russian higher education and was focused primarily on the transmission of ready-made lecture material, is today recognized as insufficient. As researchers rightly note, attempts to improve the quality of the educational process solely on the basis of the verbal classroom system no longer produce the required results [4, p. 108]. This format has been replaced by the competence-based approach, which has become the methodological foundation of modern educational standards. Its main goal is to reorient the learning process from simple knowledge transfer to the formation in students of a set of skills and qualities that allow them to act productively in a real professional environment [4, p. 109].

In scientific discourse, active debate continues regarding the correlation between the concepts of "competence" and "competency". A number of Russian researchers, based on the subject-activity approach, propose to clearly distinguish between these definitions. Competency is considered by the authors as a systemic neoplasm of the subject of activity, including knowledge, skills, abilities and personal qualities. Competences are defined as objectified characteristics of an

employee in activity, i.e., the range of issues in which he is competent and authorized to act [5, p. 67]. In other words, competence acts as a given professional standard, while competency is an established integrative quality of a person that allows him to meet this standard.

The introduction of this approach into jurisprudence means recognition of the fact that a lawyer's professionalism is measured not only by the amount of memorized regulatory legal acts, but also by the formation of his personality: motivational sphere, value orientations, professional legal consciousness and psychological readiness to bear responsibility [5, p. 68]. Based on the psychological characteristics of the subject of labor, it can be argued that a competent lawyer must have several levels of awareness of his activity. These include: understanding the social value of the result of his work, a highly developed sense of duty within the given procedural norms, conscious application of legal mechanisms as "tools of labor", and awareness of the role of interpersonal relations in the legal sphere [5, p. 69–70]. The totality of these elements forms a competitive specialist of a new type.

Methods and Results

The normative framework that consolidates the specifics of training lawyers in modern Russia is the Federal State Educational Standard of Higher Education (FSES HE) of the new generation (approved by Order of the Ministry of Education and Science of the Russian Federation dated August 13, 2020 No. 1011). The current standard 3++ finally consolidated the modular-competence-based model of education and established a rigid correlation between educational programs and labor market requirements [3]. According to the provisions of the FSES HE in the field of training 40.03.01 Jurisprudence (Bachelor's level), the field of professional activity of graduates includes the development and implementation of legal norms, ensuring the rule of law, as well as providing legal assistance. Students are purposefully prepared to solve problems of rule-making, law enforcement, law enforcement and expert-consulting types [3].

The specificity of the implementation of this standard lies in the strict structuring of the educational program into three key blocks: "Disciplines (modules)", "Practice" and "State Final Certification". While the first block forms a fundamental theoretical base, the "Practice" block plays a key role in transforming academic knowledge into real competencies. It is within the framework of educational and practical training that the student is expected to learn how to legally qualify facts, draw up procedural documents, conduct negotiations and participate in real investigative or judicial actions [7, p. 83].

The results of mastering the bachelor's program are structured in the form of three groups of competencies: universal (UC), general professional (GPC) and professional (PC). The standard includes among the universal ("supra-professional")

skills: systemic and critical thinking (UC-1), ability to work in a team (UC-3), as well as the formation of an intolerant attitude towards corrupt behavior (UC-11). Special attention is paid to business communication skills (UC-4). In the process of communication a lawyer acts in a certain socio-legal context determined by his objectively assigned role (judge, investigator, prosecutor or lawyer). Fluency in verbal and non-verbal communication techniques, the ability to construct dialogue, relieve psychological tension and exert a controlling influence constitute the most important professional quality of a specialist [7, p. 84].

The fundamental core of the legal profession is formed by general professional competencies (GPC): the ability to analyze the patterns of development of law (GPC-1), apply the norms of substantive and procedural law (GPC-2), participate in expert activities (GPC-3), professionally interpret norms (GPC-4), construct reasoned speech using legal vocabulary (GPC-5), draw up legal documents (GPC-6), comply with the principles of professional ethics (GPC-7) and effectively use information technologies (GPC-8) [3].

Particular attention today is drawn to the implementation of GPC-8, which requires modern lawyers to meet high standards in using information and communication technologies (ICT). In the current digital landscape, this competence goes far beyond basic computer literacy. The rapid integration of AI into legal practice transforms it from a potential threat to a powerful opportunity for optimizing routine processes. Future lawyers must understand the principles of machine learning algorithms used in rule-making and law enforcement: from the automated drafting of standard contracts and predictive analytics of court decisions to intelligent search systems for legal precedents. Consequently, the educational process must integrate specialized training modules that allow students to interact with AI-driven legal software. This not only increases their competitiveness in the labor market but also develops critical thinking regarding the ethical, legal, and security risks associated with AI deployment.

A significant innovation of the higher education system has been the procedure for linking educational programs with professional standards. However, the specificity of jurisprudence lies in the fact that there is no single universal professional standard for "lawyer". Only point-by-point regulatory acts have been approved (for example, "Forensic Investigator", "Competition Law Specialist"), which creates difficulties for the unification of curricula [7, p. 81]. The absence of a comprehensive system of professional standards exacerbates the problem of employment for bachelor's graduates. Many employers are skeptical about four-year legal education, preferring a specialist's or master's degree [6, p. 258].

Another integral characteristic of the professional training of lawyers is the unity of educational and upbringing processes. The uniqueness of the legal profession is due to the presence of authority and the right to apply the law on behalf of the

state, which places enormous social responsibility on the specialist [1, p. 23]. The development of professional legal consciousness and legal culture is no less important a task of the university than the transmission of academic knowledge. Professional legal consciousness should be based on deep respect for the law, awareness of the idea of the rule of law and personal responsibility [1, p. 24]. Gaps in the formation of moral attitudes can lead to professional deformation and legal nihilism [2, p. 64].

The implementation of such complex tasks requires a qualitative revision of traditional didactic methods. As A.V. Ostapenko reasonably points out, modern professional education must become innovative [6, p. 261]. Classical seminars are insufficient for the formation of such competencies as the ability to apply legal norms in non-standard situations or to carry out argumentation under stress. The development of applied skills proceeds most successfully in conditions of artificially simulated situations and role-playing [7, p. 84]. At the same time, FSES HE 3++ directly indicates the need for specialized premises in universities (courtrooms, forensic training grounds) and officially allows the replacement of real equipment with its virtual analogues [3], which opens up wide opportunities for digitalization of the educational process.

Conclusion

The specificity of professional training of lawyers at the present stage is determined by the transition to a competence-based model, strictly regulated by the requirements of FSES HE 3++. This paradigm implies a rejection of passive assimilation of information in favor of the formation of integrative qualities of the specialist's personality: solid theoretical knowledge, practical skills, communication skills and impeccable ethics. However, the full implementation of this approach within the framework of traditional forms of education is difficult, since the formation of complex practical skills requires experience of real activity and deep psychological immersion in the profession. The contradiction between the high requirements of standards and the limited possibilities of real classroom practice can be resolved by introducing innovative pedagogical tools into the educational process, including immersive virtual reality technologies and AI-based learning simulators. The use of Artificial Intelligence in legal education acts as a driving force that not only transforms teaching methods but also prepares highly qualified specialists capable of turning the technological challenges of the digital era into professional opportunities.

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HOW ARTIFICIAL INTELLIGENCE IS TRANSFORMING EDUCATIONAL PRACTICE AND EDUCATIONAL RESEARCH

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Abstract. With the rapid development of generative AI, large language models, and intelligent learning platforms, AI is entering education at an unprecedented speed. It enhances knowledge acquisition and instructional support while enabling personalized learning, cross-linguistic education, and innovation in assessment. However, its widespread application also raises concerns about academic integrity, cognitive dependence, data

privacy, and educational equity. This paper analyzes the impact of AI on educational practice and research.

Keywords: artificial intelligence; educational practice; educational research; personalized learning; educational equity.

КАК ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ ТРАНСФОРМИРУЕТ ОБРАЗОВАТЕЛЬНУЮ ПРАКТИКУ И НАУЧНЫЕ ИССЛЕДОВАНИЯ

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Аннотация. Технологии генеративного искусственного интеллекта, больших языковых моделей и интеллектуальных обучающих платформ ИИ улучшают усвоение знаний и учебную поддержку, одновременно обеспечивая персонализированное обучение, кросс-лингвистическое образование и инновации в оценке знаний. Однако их применение также вызывает озабоченность в отношении академической честности, когнитивной зависимости, конфиденциальности данных и равенства в образовании. В данной статье анализируется влияние ИИ на образовательную практику и исследования.

Ключевые слова: искусственный интеллект; образовательная практика; образовательные исследования; персонализированное обучение; равенство в образовании

Introduction

Artificial intelligence has evolved from a technical concept in laboratories into an everyday tool in real educational settings. Whether in classroom teaching, after-class tutoring, learning resource recommendation, academic writing, language learning, or educational data analysis, AI has demonstrated a strong capacity for integration. In recent years, especially with the development of generative AI, machines are no longer limited to executing simple commands; they now possess a certain degree of ability in text generation, language interaction, information integration, and problem-solving. This shift means that education is not merely “using a new technology,” but is undergoing a much deeper structural transformation.

Traditional educational models are teacher-centered, classroom-based, and organized around a unified pace of instruction. The introduction of AI breaks this singular structure. On the one hand, learners can obtain immediate feedback and

personalized assistance more conveniently; on the other hand, teachers can use technology to reduce repetitive work and devote more energy to curriculum design, intellectual guidance, and emotional support. At the same time, educational research itself is also being reshaped by AI. Researchers can not only use intelligent tools to process large-scale data, but also employ learning analytics to observe student behavior and teaching effectiveness more precisely [1, p. 4].

However, any technology entering education is not simply a matter of improving efficiency. Education itself carries multiple functions, including personal development, value formation, and social integration. Therefore, the application of AI in education contains both enormous opportunities and complex risks. How to promote educational innovation while avoiding technological alienation has become an important issue in current educational practice and research [2, p. 7].

Major opportunities AI brings to educational practice

First, AI significantly enhances the level of personalization in teaching and learning. In traditional classrooms, teachers often find it difficult to accommodate differences among students in terms of knowledge base, comprehension speed, and learning interests. As a result, some students may fall behind while others feel that the material is repetitive. AI systems, however, can dynamically adjust learning content and difficulty based on students' performance, learning trajectories, and error patterns, thereby providing more targeted support [3, p.3]. For students with weaker foundations, the system can break down knowledge points and provide repeated practice; for more advanced students, it can recommend extended resources and more challenging questions. This adaptive learning model helps improve learning efficiency and is more consistent with the educational ideal of teaching students according to their aptitude.

Second, AI expands access to high-quality educational resources. For a long time, there have been obvious disparities in educational resources among different regions and schools. High-quality teachers, courses, and tutoring opportunities tend to be concentrated in a small number of developed areas and key institutions. To a certain extent, AI tools break through the limitations of time and space, allowing students in regions with relatively weak educational resources to receive language practice, writing feedback, problem explanations, and knowledge instruction through intelligent platforms. This is of practical significance for broadening educational opportunities. In language learning in particular, intelligent systems can engage in spoken interaction at any time, correct errors in expression, and simulate real communication scenarios. Such low-threshold, high-frequency practice opportunities are difficult to achieve in traditional teaching.

Third, AI helps reduce teachers' repetitive burdens. Teachers' work includes not only instruction, but also a large number of routine tasks such as lesson preparation,

grading assignments, designing tests, compiling grades, and responding to students' questions. AI can assist with question generation, preliminary grading, teaching material organization, and classroom data analysis, thereby freeing teachers from mechanical labor. In this way, teachers can devote more time to teaching reflection, classroom interaction, and individual guidance. In other words, AI does not necessarily weaken the importance of teachers; on the contrary, it may encourage a shift in the teacher's role from "transmitter of knowledge" to "designer of learning" and "guide for development."

Finally, AI also promotes innovation in teaching forms. In the past, teaching was dominated by teacher lectures and student listening. With AI-supported education, however, new forms such as simulated dialogue, instant Q&A, project-based learning, and blended learning can be introduced. Students are no longer merely passive recipients of knowledge, but can explore, revise, and recreate in interaction with intelligent systems. This learning process places greater emphasis on initiative and is better suited to cultivating problem awareness and practical ability.

The profound influence of AI on educational research methods

AI is transforming not only the classroom, but also educational research itself. Traditional educational research often relies on questionnaires, interviews, case observation, and small-sample statistical analysis. Although these methods remain important, they have certain limitations in terms of scale, data granularity, and dynamic tracking [4, p. 7]. The development of AI technology now enables educational researchers to analyze student learning behavior and teaching processes on a broader and more detailed basis.

For example, through data recorded on learning platforms – such as clicks, time spent, response paths, and interaction frequency – researchers can construct more complete learning profiles and observe students' real behaviors during learning, rather than relying only on self-reports after the fact. Compared with traditional one-time tests, such process data can better reflect students' dynamic changes in understanding, hesitation, correction, and transfer. In addition, natural language processing technologies can help researchers analyze student essays, classroom discussion texts, and teacher feedback, thereby enabling more in-depth studies of language development, cognitive patterns, the effects of instructional interventions.

AI also promotes a shift in educational assessment from a single focus on outcomes to multidimensional process-oriented evaluation. In the past, educational assessment was often centered on scores and final results, while paying less attention to how students learned. With the support of AI, researchers and teachers can analyze students' participation, persistence, strategy use, and knowledge acquisition paths throughout the learning process. This makes educational assessment closer to authentic learning and more conducive to improving instructional design [5, p. 5].

However, it must be emphasized that richer data do not automatically mean more scientific research. The object of educational research is human beings, and human learning behavior is social, contextual, and complex. AI can help researchers identify patterns, but it cannot fully replace theoretical interpretation and educational judgment. If researchers rely excessively on technological tools while neglecting cultural background, individual emotion, and educational ethics, educational research may degenerate into superficial “data accumulation.” Therefore, AI should serve as a supporting tool for educational research rather than its sole foundation.

Realistic risks of AI in education

Although AI has brought many positive changes, its application in education is by no means without cost. The first issue deserving attention is academic integrity. Generative AI can rapidly produce essays, summaries, answers, and even research ideas. While this improves efficiency, it also easily gives rise to plagiarism, ghostwriting, and superficial task completion. Some students may no longer think independently, but simply ask the system to generate finished products. This may appear to complete learning tasks, but it actually weakens the processes of independent thinking, logical organization, and expression training. If education values only results and not processes, it can be “deceived” by technology [6, p. 2].

Second, AI may lead to cognitive dependence. The more convenient technological tools become, the more likely people are to outsource their thinking processes to machines. In the long run, if students rely heavily on AI in tasks such as writing, translation, summarization, and problem-solving, their analytical ability, judgment, and patience may be weakened. The goal of education is not to help students obtain answers more quickly, but to enable them to develop the ability to identify, understand, and solve problems. If AI results in “fewer and fewer people who know how to ask questions, and more and more people who only know how to copy answers,” then education may actually be undermined.

Third, data security and privacy protection are also issues that cannot be ignored. Educational platforms collect large amounts of data on students’ grades, behavior patterns, learning preferences, and even emotional states. Once such data are excessively collected, improperly stored, or illegally used, students’ privacy rights may be violated. This is especially concerning for younger learners, who often lack sufficient awareness of data protection. Schools and platforms therefore bear an even greater responsibility to establish clear boundaries for data use.

Fourth, AI does not automatically lead to educational equity; it may even intensify new forms of inequality. On the surface, AI broadens access to educational resources, but truly high-quality intelligent tools, stable internet environments, and adequate digital literacy are not equally available to everyone. Urban students, families with stronger economic conditions, and learners with higher technological competence are often better positioned to benefit from AI, while groups lacking

devices, stable networks, or guidance may be further marginalized [7, p. 11]. Therefore, without institutional design and public support, technological innovation will not naturally translate into equitable progress.

Pathways for the healthy integration of AI and education

In the face of these opportunities and risks, the key issue is not whether AI should be used, but how it should be used. First, a human-centered educational principle must be maintained. The core of education has always been human development, not technology itself. No matter how advanced technology becomes, the role of teachers in value guidance, emotional support, character formation, and social interaction cannot be fully replaced. AI can answer questions, but it can hardly truly understand students' anxiety, hesitation, and unique experiences; it can recommend content, but it cannot replace the judgments teachers make based on educational responsibility. Therefore, when promoting the application of AI, schools must make clear that technology serves education, rather than education adapting itself to technology [8, p. 1].

Second, teaching and assessment methods need to be restructured. Since students can now obtain information with the help of AI, education should no longer remain at the level of mechanical memorization and standardized reproduction. Instead, it should place more emphasis on comprehension, analysis, comparison, innovation, and reflection. Teachers can design more open-ended questions, more authentic tasks, and evaluation systems that focus more on process. For example, instead of looking only at final answers, teachers can require students to explain their thinking steps, compare different viewpoints, and reflect on the limitations of AI-generated output. In this way, AI will not become a tool for laziness, but rather a medium that stimulates deep learning.

Third, both teachers and students need stronger AI literacy. What truly matters is not merely whether one can use a certain tool, but whether one understands the boundaries of its capabilities, its risks of bias, and its ethical implications. Teachers need to learn when it is appropriate to introduce AI and when human judgment must remain central; students need to learn how to verify information, think independently, cite responsibly, and use AI properly. Only when users possess critical awareness can AI genuinely serve educational development.

Finally, governments, schools, and platforms should jointly establish clear ethical and governance frameworks, including rules for data protection, academic norms, accountability, and equity safeguards. The development of educational technology should not be driven solely by market efficiency; it also requires the constraint of public values. Only under conditions of regulation, transparency, and supervision can the application of AI in education gain long-term legitimacy.

Conclusion

Overall, artificial intelligence is profoundly transforming educational practice and educational research. It has created unprecedented opportunities for personalized

learning, resource sharing, teacher workload reduction, and research innovation, while at the same time raising a series of new issues concerning academic integrity, cognitive dependence, privacy security, and educational equity. [9, p.13]. Therefore, AI is neither a pure threat nor an automatic blessing, but a technological force that requires careful design, proper guidance, and continuous reflection.

The future direction of education should not be “letting machines replace humans,” but rather “allowing technology to better serve human development.” Only by adhering to the essential mission of education – cultivating people – and placing AI under the broader goal of comprehensive human growth and the public good, can we truly transform this technology into an opportunity for educational progress rather than a new source of risk [10, p.5].

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ARTIFICIAL INTELLIGENCE AS COGNITIVE EXTENSION IN CONTEMPORARY PEDAGOGICAL PRACTICE: EFFICIENCY GAINS AND POSSIBLE RISKS

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Abstract. This study is dedicated to analyzing how the mass adoption of artificial intelligence in education transforms learning cognitive processes potentially increasing their efficiency and creating new challenges.

Keywords: cognitive load; artificial intelligence; extended mind; benefits; drawbacks.

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ КАК КОГНИТИВНОЕ РАСШИРЕНИЕ В СОВРЕМЕННОЙ ПЕДАГОГИЧЕСКОЙ ПРАКТИКЕ: УЛУЧШЕНИЕ ЭФФЕКТИВНОСТИ И ВОЗМОЖНЫЕ РИСКИ

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Аннотация. Исследование посвящено анализу того, как массовое использование искусственного интеллекта в образовании трансформирует когнитивные процессы обучения, потенциально повышая эффективность и создавая новые сложности.

Ключевые слова: когнитивная нагрузка; искусственный интеллект; расширенное сознание; преимущества; недостатки.

Introduction

Generative artificial intelligence has become ubiquitous in education within three years of its public release. This rapid integration challenges established understandings of learning, cognition, and pedagogical practice. The present study examines how AI functions as both cognitive extension and potential source of dependency in contemporary educational environments.

The relevance of this topic is due to the rapid integration of AI into everyday student's practices. Half of US teachers already use ChatGPT, and a third of students rely on it for homework. The question is no longer whether to use AI, but how to use it without harming students' ability to think independently. Teachers need clear guidance, yet there's an opinion that integration of AI into education is considered to be similar to cheating.

Research Gap. This study seeks to close two problematic points in the use of AI in education. Firstly, modern research in the field of AI often considers it as a sperate tool for creating ready-made answers without taking into account its interaction with human consciousness. The second problematic element is the subjectivity of this issue, when the issue of integration is considered only from a negative or only from a positive point of view. This study connects cognitive load theory and the extended mind concept with AI integration with additional consideration of potential advantages and disadvantages to fill that gap.

The aims of this study are to develop a conceptual framework for optimizing learning in conditions of deep AI integration studying the phenomenon of using AI as an additional part of consciousness and review potential benefits and possible disadvantages from the data obtained during the secondary analysis of modern research.

Theoretical framework

The theoretical foundation of this study is relying on recent development of cognitive load study and further review of extended mind theory. Cognitive load theory, introduced by J. Sweller and further developed by J. Cooper provides framework for understanding limitations of working memory and the necessity of managing mental effort in learning. This perspective is complemented by S. G. Dedov's pedagogical elaboration of load types and optimization principles. The ethical question of artificial intelligence is introduced through Clark and Chalmers's extended mind hypothesis, which challenges conventional boundaries of cognition through the parity principle and bridges idea that human mind is not limited only by the mental processes in the head. Recent empirical investigations contextualize these theoretical insights within contemporary educational practice: Walton Family Foundation surveys document rapid AI adoption among teachers and students, while controlled studies by Google and Eedi Labs demonstrate measurable learning outcomes from AI-assisted tutoring.

Methods and results

This study is conducted using literature analysis and theoretical synthesis methodology, integrating cognitive load theory with extended mind theory to construct a conceptual framework for AI-optimized learning. The empirical component draws from secondary analysis of quantitative data from three sources: large-scale surveys conducted by Walton Family Foundation (2023–2025) that covers over 300 US teachers and students aged 12–17 [5]; a controlled experimental study by Google and Eedi Labs (2024) involving 165 students aged 13–15 comparing AI-assisted tutoring against human tutoring and hint-based instruction [6]; current state analyses by J. Crawford on 387 students in the US [3]. Data synthesis focused on identifying common patterns and educational levels regarding AI adoption rates, pedagogical applications, measured learning outcomes and problems that were revealed during research.

Cognitive load theory

Cognitive load theory, founded by J. Sweller in the 1980s, defines cognitive load as the load that a particular task imposes on the learner's cognitive system [7]. J. Cooper defined it as the total amount of mental activity imposed on working memory during a specific time period of task performance [1]. Synthesizing these definitions it could be said that cognitive load represents the mental effort expended to process information and solve tasks using short- and long-term memory. S. G. Dedov identified three types of cognitive loads: intrinsic (task complexity), extraneous (unnecessary elements), and germane (resources directed toward learning). He also identified three principles for eliminating excessive load: simplifying content, using various learning channels, and dividing information into parts [4].

This inevitably leads to the question of mind boundaries. If working memory has strict limitations, should cognitive processes be viewed exclusively as internal brain operations or they could extend. This question was reviewed by John Sweller's observation that extraneous cognitive load is determined by information presentation, implying material environment's participation in thought processes. To address this problem A. Clark and D. Chalmers introduced their extended mind concept (1998) [2]. Their parity principle states: if a process in the world functions as a process in the head would, it should not be excluded from the cognitive system merely because it occurs outside the skull. In the example of Otto, who uses an external notebook for memory due to Alzheimer's disease, Clark and Chalmers argue it functions similarly to biological memory through three criteria: constant availability (information is easily accessible), automatic endorsement (information is trusted), and past involvement (a person has already interacted or created pieces of information) [2].

Place of AI in the extended mind theory

Examining common modern tools through these criteria reveals a spectrum of cognitive extension. Smartphones satisfy all three conditions for many users: they are constantly accessible, their information is routinely accepted without verification, and they have been integrated into daily practice over years. Search engines partially meet the criteria – always available and generally trusted – but lack the seamless automaticity of biological memory; users must actively initiate searches and often critically evaluate results. Cloud storage and note-taking apps like Evernote or Obsidian approach the threshold for specific users who have deeply habitualized their use. However, generative AI presents a distinctive case. ChatGPT and similar systems meet the availability criterion universally. The endorsement criterion is more complex: novice users may not critically examine outputs, but experienced users are more acquainted to the AI-generated content, especially for its weaknesses such as hallucinations or “overagreement” with the user. The past involvement criterion varies by individual – some have used AI throughout their entire educational trajectory, establishing deep integration with own knowledge, while others remain occasional users and have not made any unique pieces of information. This variation suggests that AI functions as cognitive extension not universally, but progressively, as users develop habitual reliance and trust.

Positive impact of AI integration.

Empirical Context shows that AI has rapidly become ubiquitous in education. According to Walton Family Foundation surveys, 51% of US teachers use ChatGPT (10% daily), with 88% evaluating its impact positively; 76% consider AI integration important. Among students aged 12–17, 33% use it for schoolwork (47% in ages 12–14). The synthesized data also reveals four significant patterns. First, AI adoption in education has reached mass scale within three years since ChatGPT's launch: 51% of US teachers use ChatGPT professionally, with 88% evaluating its impact positively [5]. Student usage can be mostly seen among younger groups (47% of 12–14 age group versus 33% overall). Cross-national variation is substantial, with Chinese educators showing 95.5% adoption rates compared to 42% in the UK [6]. Second, experimental evidence demonstrates superior learning outcomes: AI-assisted students achieved 66% success on complex subsequent tasks, outperforming both human-tutored (61%) and hint-based groups (56%) [5] [6]. Third, efficiency gains are quantifiable: AI reduces teachers' administrative workload by 20–40%, generating up to 13 weekly hours for direct student engagement, with specific reductions in lesson planning (30–50%), test creation (2–3 hours weekly), and grading (40–60%) [6]. Fourth, implementation gaps persist: 72% of US teachers lack administrative guidance on AI use, creating conditions of unprepared adoption, while 50% of UK educators remain non-users [6].

Research by Google and Eedi Labs demonstrated effectiveness of current AI usage among students: 165 students using generative AI tutoring showed 66% success on complex tasks versus 61% with human tutors and 56% with hints; 76.4% of AI responses were approved with minimal or no edits. Studies also indicate that AI can potentially reduce teachers' administrative time by 20–40%, freeing up to 13 hours weekly [6].

Pedagogical Implications is that AI offers significant advantages. Time savings are significant due to the lesson preparation acceleration up to 30–50%, grading time reduces by 40–60%. Personalization becomes possible: adapting materials for different levels, creating individual trajectories, generating alternative explanations. Improvement of study materials quality shows AI assistance increases cognitive complexity of assignments, shifting from information reproduction to higher-order thinking skills. Professional development is supported through scenario modeling and lesson analysis. However, challenges remain. 72% of US teachers received no guidance on AI use [5]. However, research indicates that some risks remain. The researchers mention AI hallucinations, ethical dilemmas of transparency, fairness and digital inequality as a most spread problems among teachers.

Drawbacks of AI integration into educational process

A critical barrier to AI integration stems from fundamental reliability issues. Generative AI systems routinely produce hallucinations—confidently stated but factually incorrect information—ranging from minor inaccuracies to entirely fabricated citations or events. Unlike traditional tools where errors are typically obvious, AI outputs appear polished and authoritative, making them particularly dangerous for users lacking expertise to verify claims. This creates a paradox: the more users rely on AI for cognitive offloading, the less capacity they retain for critical evaluation, yet verification demands exactly the cognitive resources they have outsourced. Educational contexts amplify this risk, students may submit AI-generated essays containing false references, teachers may propagate incorrect content to entire classes, and institutional credibility suffers when errors surface. Current solutions remain inadequate: manual fact-checking consumes time saved by AI automation, automated verification tools are themselves imperfect, and AI confidence scores often mislead rather than inform.

Another barrier is mental health deterioration and the degradation of social skills. As revealed in J. Crawford's study, students using artificial intelligence sought psychological help more frequently. It was also noted that active use of AI in learning significantly affects social skills, anxiety levels, and the ability to use traditional methods of information acquisition. The researcher also mentions additional threat which is in the fact that companies may use AI to collect confidential information about users without their knowledge, which threatens privacy of students, teachers and educational establishments [3].

Conclusion

Contemporary trends indicate transition to systematic AI integration. Hybrid models prove most effective – autonomous AI system with human oversight. The teacher's role shifts from information transmission to developing critical thinking and managing students' cognitive ecology. Maximum effectiveness is achieved not by replacing teachers with AI, but by enhancing pedagogical capabilities through intelligent tools preserving human connection and professional judgment. The educational task shifts to forming skills for managing distributed cognitive systems, where AI functions as an amplifier rather than replacement of human intelligence. However, the question of the official introduction of AI into modern curriculums and methods to combat the negative impact on humans remains open.

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DEVELOPING POST-WRITING SKILLS IN LINGUISTICS STUDENTS USING CHATBOTS

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Abstract. The article is devoted to the development of post-writing skills among linguistics students using chatbots. The necessity of a structured approach to creating prompts for chatbots is substantiated. Examples of practical tasks designed to build an effective process of improving post-writing skills are presented.

Keywords: writing skills, revision stage, scaffolding, chatbots, instructional design

РАЗВИТИЕ УМЕНИЙ ПИСЬМЕННОЙ РЕЧИ НА ЭТАПЕ РЕДАКТИРОВАНИЯ У СТУДЕНТОВ-ЛИНГВИСТОВ С ПОМОЩЬЮ ЧАТ-БОТОВ

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Аннотация. Статья посвящена развитию навыков редактирования текстов у студентов-лингвистов с помощью чат-ботов. Обосновывается необходимость структурированного подхода к составлению промптов для чат-ботов. Представлены примеры практических заданий, разработанных для выстраивания эффективного процесса совершенствования навыков редактирования.

Ключевые слова: навыки письма, этап редактирования, скаффолдинг, чат-боты, педагогический дизайн

Introduction

The process of mastering writing skills in a foreign language is considered the most difficult task for students. Writing, being a productive skill, requires certain higher-order cognitive abilities, including: good command of the language, the ability to build coherent sentences, writing process management skills, genre and audience awareness, and revision ability [8].

Despite the fact that the reviewing stage is a very important part of the writing process, for L2 students this stage often reduces to a mere correction of grammatical and lexical errors, neglecting the stage of the content revision necessary to achieve their writing goals. Recent research has shown that even with the help of Artificial Intelligence (AI) students tend to focus on surface-level issues like spelling and grammar, rather than working on improving the higher-order elements such as content, organization and cohesion [7].

The success of organizing the text revision process for linguistics students directly depends on their linguistic and metacognitive abilities [11], and on the writing task itself. Language proficiency, self-assessment skills, as well as the type of feedback received play an important role in improving one's own text.

However, it is not only a lack of skills that prevents text improvement. Recent research has confirmed that students are concerned about the lack of time allocated to writing development [14]. Also, the existing learning model implies a delayed feedback model. Due to the number of people in the group, teachers do not always have the opportunity to give detailed feedback to students on all aspects of the writing tasks, which has a strong negative effect on the revision process.

With the development of Large Language Model (LLM)-based chatbots, that are able to analyze and maintain instant conversation, researchers have started to raise questions about appropriate implementation of this tool into the writing training to address the issue of classroom limitations [12]. Unlike earlier automated writing evaluation (AWE) tools that provided generic feedback, chatbots can engage in dynamic conversation adjusted to individual needs and error patterns [9], which is especially crucial for post-writing.

Despite the fact that the interest in AI-assisted writing is growing and new research is emerging, the lack of clear instructional guidelines related to post-writing skills development with AI remains. To address this gap, the structured pedagogical framework for integrating AI into the post-writing instructions was proposed in this article.

Theoretical framework

The writing process itself is considered as a set of cyclically repeating phases of planning, translating, and reviewing, where the planning part is dedicated to activating one's background knowledge of the topic and determining relevant information for establishing writing goals and creating a plan. The translation stage happens when the writing plan is being transformed into a text. After the text production stage, the reviewing stage starts, including both reading and editing. Post-writing is often confused with editing, but composition theory distinguishes three levels [13]: revising (reorganizing content, refining argument), editing (correcting surface errors), and proofreading (checking formatting). However,

editing can occur during any stage of the writing process, reviewing itself occurs only after the translation stage, as an intentional post-writing action of the text improvement.

During the reviewing process writers have an opportunity to correct their grammar and spelling mistakes, address their content-related issues and enhance the weakest parts of the text [3], [10]. Heaton's [4, p. 135] model highlights the necessity of mastering not only the language itself, but also developing creative and critical thinking for excluding irrelevant information and evaluating your own work.

According to Vygotsky's Zone of Proximate Development theory (ZPD) [15], cognitive skills are developed through communication with more experienced colleagues, experts, and peers. Therefore, students who currently do not have the necessary skills to improve their own text, should not learn in isolation, but through dialogue and collaboration. In terms of post-writing, teachers, as the more knowledgeable others, are supposed to scaffold learners within their ZPD, helping them to complete more complex tasks they could not manage alone.

In terms of classroom limitations, a proliferation of LLM-based chatbots such as ChatGPT, Claude, Gemini, and DeepSeek began to be considered as a potential solution. With special prompts, these chatbots can analyze the user's proficiency level and adapt provided instructions to the writing style of the user, remembering facts as the conversation progresses and using specialized vocabulary appropriate for learners' needs [12].

Recent research has shown that the use of chatbots in writing instruction has had a positive effect on the development of students' post-writing skills due to these opportunities provided by AI: instant feedback, writing assistance, revision of weak aspects of the text, grammar and spelling correction [1]. Chatbots can not only identify superficial errors, but also help with improvements of logical reasoning, the logical quality of essays and overall essays quality after using chatbots for gathering information and exercising with AI [16].

Chatbots can analyze errors based on specific criteria, highlighting the strengths and weaknesses of the work. By analyzing this, students develop evaluation skills and, subsequently, develop such metacognitive strategy as self-evaluation, which has been proven to significantly improve the psychological and academic achievements of the learners [5].

Despite the positive aspects, scientists are concerned that the introduction of AI may harm the educational process. A primary concern is that instead of using AI as an auxiliary tool, some students complete tasks entirely through a chatbot, especially outside the classroom. This hinders the learning process and prevents the development of critical writing skills [2]. The researchers advocate for a hybrid model of AI integration, merging teacher scaffolding with autonomous tool use [6].

Methods and results

This study represents a theoretically grounded instructional design for developing EFL post-writing revision skills using chatbots. The aim is to offer a sequence of tasks for B2-C1 level learners according to the Common European Framework of Reference for Languages (CEFR), with teacher roles, and learning objectives. The tasks assume that students have already produced an original written text prior to the revision stage. The tasks are sequenced from lower-order (grammar, spelling) to higher-order (cohesion, logical flow), reflecting the typical progression of revision skills.

Task 1: Proofreading

Students post the text they wrote earlier into the chatbot and use the following prompt: *“Highlight only the grammar and spelling mistakes in this text in bold. Do not change vocabulary, style, or sentence structure. List each error with a short grammatical explanation.”*

Students should review the chatbot’s output and create a table with 4 columns: 1) error type; 2) incorrect sentence; 3) corrected version suggested by the AI; 4) comment evaluating the chatbot’s work.

The teacher’s role is to organize the process, prevent the misuse of AI, review assignments, explain common error patterns, provide a model, review tables, lead discussion of chatbot’s mistakes. The cognitive demand of the task is low; students follow an algorithm and work with information without substantial evaluation.

The presented prompt was tested on the theoretical part of this article, revealing errors such as: several omissions of the definite article “the” and the omission of the apostrophe. This proves that this prompt is accurate and is unlikely to produce unexpected results.

Task 2: Improving word choice, formality level, collocations, and avoiding repetition or false friends.

Students should take a paragraph from their draft and ask the chatbot: *“Identify lexical issues in this text: weak or vague verbs, incorrect collocations, repeated common words, or words that do not fit the register (e.g., too informal for academic writing). For each, suggest a more precise alternative and explain why it is better.”*

After reviewing the AI’s answer, students must select 5 errors, write out the original phrases, write out the alternative proposed by AI and write their comment with an explanation whether they accept, reject or modify the AI suggestion. This stage is aimed at developing lexical accuracy. By comparing their answers with the answers offered by the AI, students develop critical assessment skills, which prevents passive acceptance of the AI results.

The teacher’s role is to demonstrate the difference between grammatical correctness and lexical appropriateness; discuss cases where chatbot suggestions change intended meaning. The cognitive demand of the task is moderate, students

must evaluate suggestions, exercise judgment, and decide on acceptance or rejection. This prompt was also tested on the article, emphasizing the excessive use of the word “process” in the text and suggesting alternatives as: “procedure”, “stages”, “cycle”.

Task 3: Coherence and Cohesion Correction.

Students paste a longer piece of writing (3+ paragraphs) and ask the chatbot: *“Do not rewrite. Instead, analyze my text’s coherence and cohesion. Answer these three questions separately: A) Where is a logical jump or missing connection between ideas? Quote the sentences. B) Which pronouns or demonstratives (this, these, it, they) have unclear referents? Quote them. C) Suggest one additional linking word or phrase for every two paragraphs to improve flow, and show exactly where to insert it.”*

Student individual activity: *1. Manually revise the text based on the chatbot’s diagnosis. 2. Adjust any suggested linking phrases to fit their intended meaning. 3. Paste the revised version and ask for a final rating: “On a scale of 1-5, rate the coherence and cohesion of this revised text and justify the score.”*

The teacher’s role is to check that students have made their own revisions instead of accepting suggestions uncritically. Cognitive demand of the task is high; students must interpret diagnostic output and make independent revision decisions. The presented prompt highlighted several logical errors in the narrative of the article, suggesting improvement options.

However, this framework has several limitations that should be acknowledged. The proposed tasks have not been tested in actual classroom settings. Their effectiveness for learning outcomes remains hypothetical. The design assumes that LLM-based chatbots will consistently produce accurate error analyses. In practice, chatbots may generate false positives, miss context-dependent errors, or provide inconsistent output across repeated prompts.

Conclusion

The integration of AI chatbots into EFL writing instruction offers significant potential for developing revision skills, but this potential is only realized within a structured pedagogical framework. The set of exercises developed on the basis of pedagogical recommendations aims to achieve the competent integration of chatbots into the process of developing students’ post-writing skills. Due to the logical arrangement of tasks from simple to complex and the gradually decreasing support of the teacher, the proposed framework corresponds with cognitive load theory and sociocultural principles of scaffolded learning.

However, the framework directly addresses the classroom limitations, such as delayed feedback and teachers’ inability to focus on every student, the limitations of this framework should be acknowledged. The proposed framework is theoretical and its effectiveness for learning outcomes remains hypothetical

Despite the fact that chatbots will continue to evolve and teachers will have to adapt to new technologies, the main pedagogical principles will continue to exist: scaffolding and critical engagement with AI feedback.

Future research must move from the theoretical design of exercises to their application in a real classroom, focusing on gradual transfer to unassisted writing and the development of metacognitive self-regulation among students.

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ARTIFICIAL INTELLIGENCE: THREAT OR OPPORTUNITY?**

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