Russian Language Studies
Русистика
ISSN 2618-8163 (Print); ISSN 2618-8171 (Online)
2026 Vol. 24 No. 1 7–24
http://journals.rudn.ru/russian-language-studies

MODERN LINGUODIDACTICS
СОВРЕМЕННАЯ ЛИНГВОДИДАКТИКА

DOI: 10.22363/2618-8163-2026-24-1-7-24
EDN: XAPPLW

Research article

Artificial intelligence in contemporary language education research: a corpus and network analysis

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Abstract. Modern linguodidactics is being fundamentally transformed because of the intensive use of artificial intelligence (AI) in education. This requires a comprehensive analysis of the current state and development trends in this field. The study is aimed at identifying the evolutionary directions and thematic structure of scientific discourse on AI in teaching Russian as a foreign language in 2022–2025. The research is based on publications from open resources, CyberLeninka and eLibrary. The methods of bibliometric and content analysis, frequency and terminological analysis based on TF-IDF, thematic modeling, terminological diversity assessment with the Shannon index, network analysis with the Louvain algorithm, and ForceAtlas2 visualization are applied. A clear evolutionary direction in discourse development has been identified, from describing tools and stating their capabilities (2022) through the integration of AI into learning tasks and scenarios (2023) and methodological optimization (2024) to focusing on motivation, learning personalization and critical analysis of socio-pedagogical consequences (2025). Network visualization of authors' connections revealed a segmented structure with a core-peripheral organization and four key topics: the implementation of AI services, speech skills development, digital transformation of linguodidactics, and the methodological normalization of AI usage. Further development of the field is the transition from issues of technical capability to the studying productive ways to use AI tools in teaching Russian as a foreign language, adaptive learning systems, methods for assessing digital literacy and forming new types of language competence, including the ability to critically evaluate AI-generated content.

Keywords: linguodidactics, Russian as a foreign language, generative language models, chatbots, automated assessment, corpus analysis, network analysis, thematic modeling

Funding. The work is part of the project № 050738-0-000 of the RUDN University grant system for support of research projects.

Conflict of interest. The author declares no conflict of interest.

Article history: received 22.06.2025; accepted 20.10.2025.

For citation: Goncharova, O. V. (2026). Artificial intelligence in contemporary language education research: A corpus and network analysis. *Russian Language Studies*, *24*(1), 7–24. http://doi.org/10.22363/2618-8163-2026-24-1-7-24 EDN: XAPPLW

Introduction

Modern linguodidactics is being fundamentally transformed because of the intensive use of artificial intelligence (AI) in education. In the context of our study, AI is understood primarily as natural language processing algorithms and generative models capable of analyzing, generating and evaluating written and oral utterances. This transformation is based on the transition from the sporadic use of digital tools to the systemic integration of AI technologies into the methodological apparatus of language education. Previously, AI was considered primarily as a set of auxiliary digital services, but today it is becoming the core of new pedagogical models focused on individualization of learning, operational feedback, and scaling of methodological solutions. The growing scientific interest in this issue is reflected in the growing number of publications devoted to the use of AI technologies for formation of communicative competence. An analysis of modern research, including international reviews (Huang et al., 2023; Crompton, Burke, 2023), indicates the accumulation of empirical data confirming the effectiveness of AI tools in various contexts of language education. At the same time, foreign works before 2022–2023, i.e. the initial stage of mastering the toolkit often describe these contexts in the categories of language learning (first (L1), second (L2) and foreign (Foreign Language, FL) languages), which is conceptually close to the notions of teaching native, non-native and foreign languages in the Russian scientific tradition[1]. The accumulated material shows the transition from certain practices to a systematic restructuring of educational processes, where principles of language competence formation change, the roles of participants in educational interaction are redistributed, and assessment procedures are transformed. The research focuses not only on the question whether such technologies are effective, but also which components of language competence they develop, which conditions they have the greatest effect in, and which didactic and ethical constraints must be taken into account when implementing them.

Teaching foreign languages was among the first educational fields where AI technologies were actively used. In the 2010s, automated translation systems, electronic dictionaries, and interactive language learning programs with the elements of machine learning and AI were actively used. Since the early 2020s,

[1] To ensure terminological clarity and comparability with international studies, the following term correspondence has been adopted in this study: teaching a native language corresponds to the category of first language (L1), teaching a non-native language corresponds to the category of second language (L2), and teaching a foreign language corresponds to the category of foreign language (FL).

there has been a qualitative shift in the field of computer-based foreign language teaching tools due to the emergence of large language models from Sberbank, Yandex and other developers. P.V. Sysoev & E.M. Filatov (Sysoev, Filatov, 2023b) note that research has evolved from simple testing of individual applications to a comprehensive understanding of the changing roles of teachers and students in the educational process. The key advantage of AI in this area is the ability to continuously personalize learning through the use of adaptive platforms which adapt content to the needs of each student (Legostaeva, Livensky, 2021). Empirical data confirm the positive impact of such systems on the development of receptive and productive skills, vocabulary growth, the formation of intercultural competence (AlTwijri, Alghizzi, 2024), and learning engagement (Ma, Chen, 2024).

Generative chatbots are a promising area. Unlike earlier versions with template responses, modern AI agents based on generative pre-trained transformers (GPT) maintain a meaningful dialogue, which can contribute to the development of dialogic speech, reduce the language barrier, expand the vocabulary (Nagel, Li, 2022; Sysoev, Filatov, 2023a), and improve writing skills (Chan et al., 2023). However, teachers express concerns about misuse of AI by students, who may completely delegate writing to neural networks; this is confirmed by the global spread of "AI plagiarism" recorded in 2023 (Sysoev, 2024). In response to these risks, strategies are being developed to teach students how to interact with AI and edit generated content and fact check to transform technology from a potential threat into a useful didactic resource (Semyonkina, Prusakova, 2025).

In the field of native language teaching, AI is mainly a tool for analyzing complex texts, a means of individualizing reading and writing, or a creative assistant offering ideas for essays and editing the drafts (Acerra, Gervais, Petitjean, 2024). At the same time, the use of automated assessment systems for written papers is expanding in national examination systems. For example, in China, AI solves the problem of heavy workload when checking essays (Chan et al., 2023); in the United Arab Emirates[2] and some Arab countries, the use of AI tools for evaluating written speech (essays) is also being discussed (Qwaider et al., 2025; Crompton, Burke, 2023). Similarly, an Учи.ру educational platform[3] in Russia uses AI to individualize native (Russian) language learning among schoolchildren. However, research warns that the potential of AI tools is limited; for example, AI is good at detecting technical errors and can score points

[2] Qwaider, C., Alhafni, B., Chirkunov, K., Habash, N., & Briscoe, T. (2025). Enhancing Arabic Automated Essay Scoring with Synthetic Data and Error Injection (arXiv:2503.17739). arXiv. Retrieved January 16, 2026, from https://arxiv.org/abs/2503.17739

[3] Uchi.ru. (n.d.). Uchi.ru: Distance education for school students and teachers. Retrieved January 16, 2026, from https://uchi.ru/

according to specified criteria, but it cannot evaluate the depth of the content (Sysoev, Filatov, 2023b).

The use of AI technologies is widely studied in teaching a non-native language (L2), where they partially compensate for the lack of a natural language environment, support individual learning, and build targeted differentiation of tasks and feedback (Steinhoff, 2025: 85–89). In a Swiss elementary school, AI was used for preliminary text analysis taking into account the linguistic and cultural characteristics of students (Steinhoff, 2025: 85–89). AI revealed not only rarely-used words, but also potential difficulties with the interpretation of metaphors and idioms that could remain unnoticed. Thus, AI acts as an intermediary between the already formed competence in the native language and the new requirements of the language being studied, expanding the teacher's toolkit and reducing the cognitive load of students. The key conclusion is not to replace, but to strengthen pedagogical activity. Gafurova (Gafurova, 2023) confirms that maximum effectiveness is achieved with a combined model that integrates traditional teaching with a teacher and interactive AI practice. Although fully autonomous learning with AI has shown lower results, its integration contributes to the growth of students' motivation, engagement, and autonomy (Gafurova, 2023).

An important task for integrating AI into language teaching is to expand opportunities for language practice outside the classroom and compensate for the lack of communicative experience. The didactic potential of chatbots allows to simultaneously activate professionally oriented vocabulary, improve the ability to write abstracts and develop critical perception of AI conclusions because students learn to identify its semantic and factual errors (Dzyuba, Eremina, Mushenko, 2023). Modern AI systems also provide automatic pronunciation assessment, localize difficult segments, and offer exercises based on error typology (Dzyuba, 2024: 242–261). Testing of such technologies in teaching Russian as a foreign language demonstrates their effectiveness for organizing independent work without loss of quality control (Dzyuba, 2024: 242–261). The use of AI in certification tests in the Russian language also seems promising. Its potential in the sphere was actively discussed in the early 2020s, but AI assessment requires ensuring validity and reliability. Therefore, certification exams are still conducted without AI (Elnikova, 2020: 20–26). Nevertheless, the first experiments indicate the productivity of AI tools in intermediate control. For example, an AI system for checking lexical and grammar tests was tested at Financial university and showed a statistically significant correlation with the grades of teachers, although the coincidence was not absolute (Kozlovtseva, 2023). The authors emphasize that AI better copes with typical mistakes and tasks with the only answer, while the assessment of communicative competence still requires human expert assessment.

A comparative analysis of the existing practices of using AI in language teaching identifies both general trends and specific features. The common feature

for all spheres is the evolution from automation of certain operations, such as grammar checking and translation, to complex modeling of educational scenarios and solving pedagogical and ethical tasks, including motivation, academic integrity, and critical thinking. The key differences are as follows. In teaching a native language, AI acts primarily as a tool for analyzing and creating complex texts, as a creative assistant. In teaching a foreign language, the focus is the formation of foreign language communicative competence and overcoming the language barrier, where chatbots and automated feedback systems play a key role. In teaching a non-native language, the main function of AI is compensation for the lack of a linguistic environment and a means of cultural and linguistic adaptation. Technologically, speech generation, recognition technologies, and dialog systems for communication practice are critically important for foreign and non-native languages, whereas complex text analysis and automatic referencing systems are mainly used for native languages. The problems also differ significantly. In teaching a foreign language, the widespread access of students to generative models evolved the so-called "AI plagiarism", and strategies for academic honesty are especially important. For the native language, the most relevant issue is the validity of the automatic assessment of the essay content. In the field of non-native language, the issues of considering linguistic and cultural characteristics of students and preventing persistent language errors under the influence of AI are relevant.

The revealed general logic of the evolution of AI in language teaching creates a methodological basis for more detailed and focused research in a specific subject area. The area where the described trends are most clearly and comprehensively manifested is teaching Russian as a foreign language. The intensive digital transformation of Russian as a foreign language, which began at the end of 2022 due to the massive introduction of generative technologies, has led to a significant increase in publications and practices that require a systemic understanding. Against this background, the relevance of the subsequent study, focused on the use of AI tools in teaching Russian as a foreign language, is obvious. The rapid growth of practices and publications, the transition from descriptions of opportunities to their methodological normalization, and the variety of tools make it necessary to conduct a systematic analysis to describe the recent dynamics in the field, reconstruct stable thematic clusters, and compare technological innovations with real didactic solutions.

The aim of this study is to identify the evolutionary trajectory and thematic structure of scientific discourse on the use of AI in teaching Russian as a foreign language in 2022 to 2025 and, on this basis, to build a research agenda for the following years, link technological progress with the tasks of teaching, evaluating, and forming academic integrity. The formulated aim proposes a logical continuation of the presented review, from a historical and methodological retrospective and a comparative analysis of existing practices in the field of

using AI in language teaching to a structured description of the modern research and the identification of key growth trajectories that will require further theoretical and practical studies.

Methods and materials

The work uses general scientific methods (scientific analysis, synthesis, induction and deduction, comparison, classification, and generalization) and special methods (bibliometric and content analysis of the corpus; frequency and terminological analysis based on TF-IDF; thematic modeling; assessment of terminological diversity according to the Shannon index; network analysis (bipartite model "article – author", detection of communities by the Louvain algorithm, visualization of ForceAtlas2); methods of preprocessing linguistic data (tokenization, lemmatization, and removal of stop words); as well as visualization methods (heat maps of the term dynamics).

To achieve the aim of the study, a representative body of publications has been formed for the period from 2022 to 2025. The chronological period was chosen due to its significance as a period of intensive transformation of Russian as a foreign language sphere, which began at the end of 2022 after the massive introduction of generative technologies. The corpus was formed of 155 publications on the use of AI in teaching Russian as a foreign language[4] in open sources CyberLeninka[5] and eLibrary[6]. They were selected with combined queries: ("artificial intelligence" OR "AI" OR "neural network" OR "GPT") AND ("RFL" OR "Russian as a foreign language"). The year of publication was taken from the bibliographic descriptions. The primary data are consolidated into a single table[7] containing four attribute fields for each publication: 1) Name/Author: title of the article, full name of the authors, bibliographic data (journal, year, pages); 2) Keywords: f list of author's keywords; 3) Abstract: the text of the abstract; 4) References: a complete list of cited sources (including DOI/URL). The preprocessing of keywords and abstracts was as follows: tokenization → lemmatization → removal of stop words. NLTK stop lists were used for the analysis, and terms from the search query ("artificial", "intelligence", "Russian", "RFL", etc.) were added to the list. Since the wors were found in every abstract and keyword list, lemmatization was performed using pymorphy3[8] with all words being taken in their initial (dictionary) form (for example, nouns

[4] brainteaser-ov. (n.d.). AI-in-RFL [Code repository]. GitHub. Retrieved January 16, 2026, from https://github.com/brainteaser-ov/AI-in-RFL

[5] CyberLeninka. (n.d.). CyberLeninka: Scientific electronic library. Retrieved January 16, 2026, from https://cyberleninka.ru/

[6] eLIBRARY.RU. (n.d.). eLIBRARY.RU: Scientific electronic library. Retrieved January 16, 2026, from https://elibrary.ru/

[7] brainteaser-ov. (n.d.). AI-in-RFL [Code repository]. GitHub. Retrieved January 16, 2026, from https://github.com/brainteaser-ov/AI-in-RFL

[8] Ibid.

in the nominative singular, verbs in the infinitive). To assess the informative value of the tokens, a weighted TF-IDF indicator was used, which is calculated as the multiplication product of the term relative frequency in a document by a logarithm reflecting the inverse proportion of documents containing this term. Thus, the high TF-IDF indicates not just a frequently occurring, but a specifically significant word characteristic of the selected period of the corpus:

$$TF - IDF_{t,d} = \frac{f_{t,d}}{\Sigma_j f_{j,d}} \times \log \frac{N}{n_t},$$

where $f_{t,d}$ is the absolute frequency of the term t in the document d; $\sum_j f_{j,d}$ is the total number of words in the document; N is the number of documents in the corpus; n_t is the number of documents containing the term t.

To compare the frequency by year, two TF-IDF matrices, by keywords and by abstracts, were constructed, followed by visualization of the term dynamics on heat maps (Figure 1 shows the frequency of lexemes in abstracts; Figure 2, in keywords). Visualization was performed by a separate module that aggregated the annual XLSX files according to a naming pattern, combined the "term ×year" matrices (outer — merge by the name of the term, the gaps were filled with zeros) and visualized them using the matplotlib.pyplot.imshow method[9] of the Python programming language, where the X axis corresponds to years; the Y axis, terms; and the intensity of colors reflect the TF-IDF value. These maps were the basis for a comparative analysis of time trends. Thematic modeling was carried out on coruses of abstracts using the non-negative matrix factorization method (Gillis, 2014) with the number of topics $k = 5$; six marker words were selected for each topic (Table 1).

The Shannon entropy index (Chen, Liu, Altmann, 2017) was used to quantify terminological diversity, calculated using the formula

$$H = -\Sigma(pi \times \log_2 pi),$$

where pi is the relative frequency of the term i ($pi = ni/N$); ni is the frequency of the term i; N is the total number of terms in the corpus; Σ is the sum of all unique terms in the corpus of keywords. The index measures the degree of conceptual differentiation of the research field: higher H values indicate greater terminological diversity.

For the network stage, export from the pivot table to CSV format compatible with Gephi[10] has been developed. From the field "Name /The author" we extracted the title of the article (the first non-empty line) and the full list of authors with normalization of writing forms; the names of the authors of each

[9] brainteaser-ov. (n.d.). AI-in-RFL [Code repository]. GitHub. Retrieved January 16, 2026, from https://github.com/brainteaser-ov/AI-in-RFL

[10] Gephi. (n.d.). Gephi: The Open Graph Viz Platform. Retrieved January 16, 2026, from https://gephi.org/

bibliographic position were extracted from the "Literature" field. Based on this, the following were generated: (i) the nodes.csv file with the fields Id, Label, Type (Article/Author) and the Authors attribute for the article nodes; (ii) an edges.csv file with two types of edges: directed "article → author (from bibliography)" with the cites label and the weight Weight and non-directed Author-Author coauthor with aggregated weight by pair. The bipartite article — author network imported into Gephi was visualized by stacking Force Atlas 2; the Louvain algorithm[11] was used to identify communities, and then clusters were interpreted by node attributes (Label, Type, modularity class), followed by ranking and thematic profiling. The final graph and thematic results correlated with the conclusions of text analytics, which allowed to validate the stability of thematic cores and verify the consistency of author communities with the dynamics of terms.

Results

The analysis revealed an evolutionary trajectory of the discourse on the use of AI in teaching Russian as a foreign language in 2022–2025. The results demonstrate a consistent change in research focus, from cataloging tools and stating their basic capabilities in typical tasks on Russian as a foreign language to integrating AI into learning tasks and scenarios, then to developing specific methods for their use, and finally to discussing student motivation, personalization of learning, and the quality of educational materials.

Network visualization of authors' connections revealed a segmented structure with a clear core-peripheral organization with the following key topics: 1) the use of AI services in teaching Russian as a foreign language; 2) the development of speech skills in an AI-mediated environment; 3) the digital transformation of linguodidactics and didactic design; 4) methodological rationing and critical reflection on using AI as a tool for solving specific learning tasks in learning the Russian language.

An important conclusion is the revealed systematic effect of terminology migration; new concepts at the example of the lexeme "нейросеть" 'neural network' are first fixed in abstracts and after 1–2 years they move into the keyword field. This fact may indicate that keywords are conservative to some extent and are widely used only after a certain conceptual assimilation of the term by the scientific community.

Discussion

The TF-IDF matrix for keywords demonstrates a clear temporal stratification of the terminological field connected to AI in teaching Russian as a foreign language. In 2022, lexemes with technical meaning dominated: "bot"

[11] Wikipedia contributors. (n.d.). Louvain method. Wikipedia. Retrieved January 16, 2026, from https://en.wikipedia.org/wiki/Louvain_method

(TF-IDF ≈ 0.85), “chat” (TF-IDF ≈ 0.78), “program” (TF-IDF ≈ 0.72) and “digital” (TF-IDF ≈ 0.68). These indicators show that the research discourse focuses on the instrumental characteristics of technologies, which is typical for the initial stage of developing a new subject area (Figure 1).

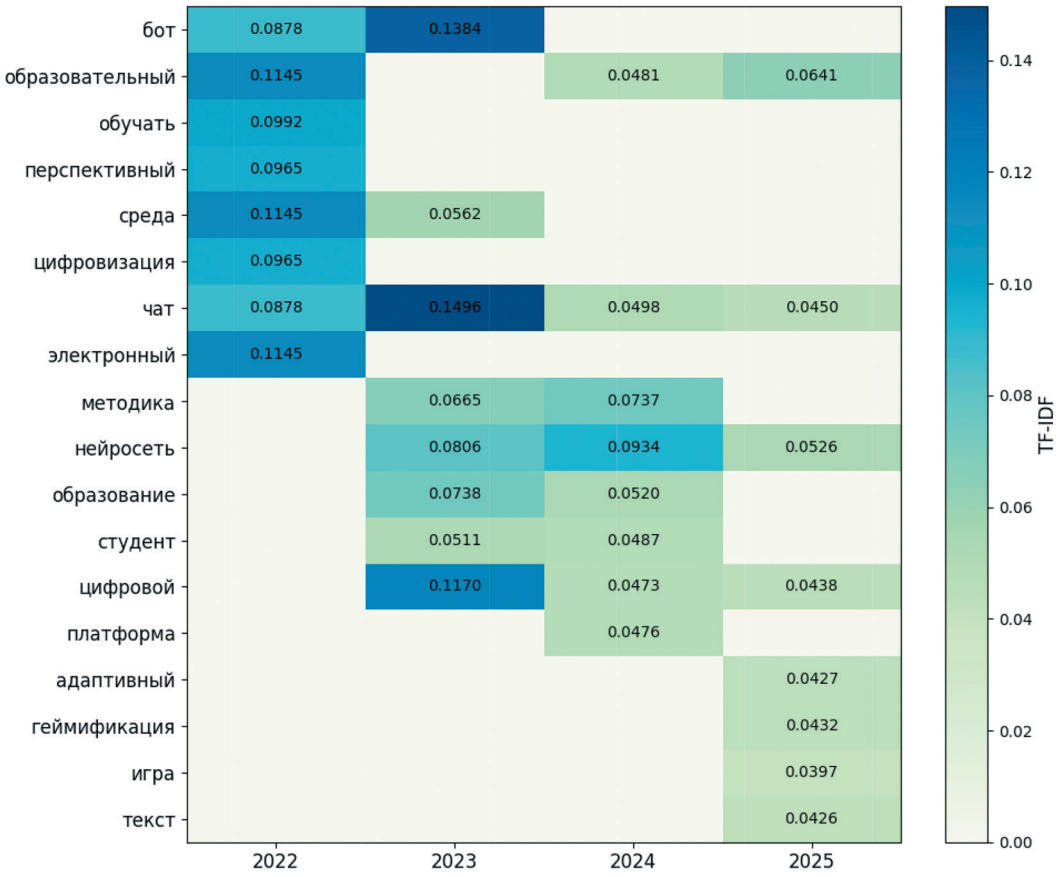

Figure 1. The frequency dynamics of key words in the articles per year

Source: prepared by O.V. Goncharova.

Thematic modeling revealed the specific features of adapting AI technologies to the tasks of teaching the Russian language. In 2022, the dominant topics included technical characteristics of chatbots (bot, chat, algorithm), common digital tools (digital, mobile), organizational aspects of distance education (distance, quality), and analysis of software capabilities (program, analyze). This outlined the general introductory and predictive nature of the period with its focus on the potential and prospects of new technologies. By 2023, there was a noticeable shift towards the integration of AI into the educational process. Even though “technological” terms retained high importance, the frequency of lexemes “student” (TF-IDF ≈ 0.79), “task” (TF-IDF ≈ 0.74) and “teacher” (TF-IDF ≈ 0.71) is increasing in abstracts and

keywords, focusing on the participants of learning process and elements of pedagogical practice (Figure 2). The emergence of "neural network" as a significant term was a marker of the growing interest in the generative capabilities of AI in creating educational materials. The thematic analysis confirmed this trend (Table 1): topics reflected the use of AI in culturally oriented contexts of teaching Russian (student, culture, Chinese), the creation and use of educational materials (text, task, translate), automatic content generation (generation, automatic), the development of digital environments (environment, development, Internet), and implementation practices (implementation, use, means). This period is transitional, and technologies began to adapt to specific methodological tasks and needs of students and teachers.

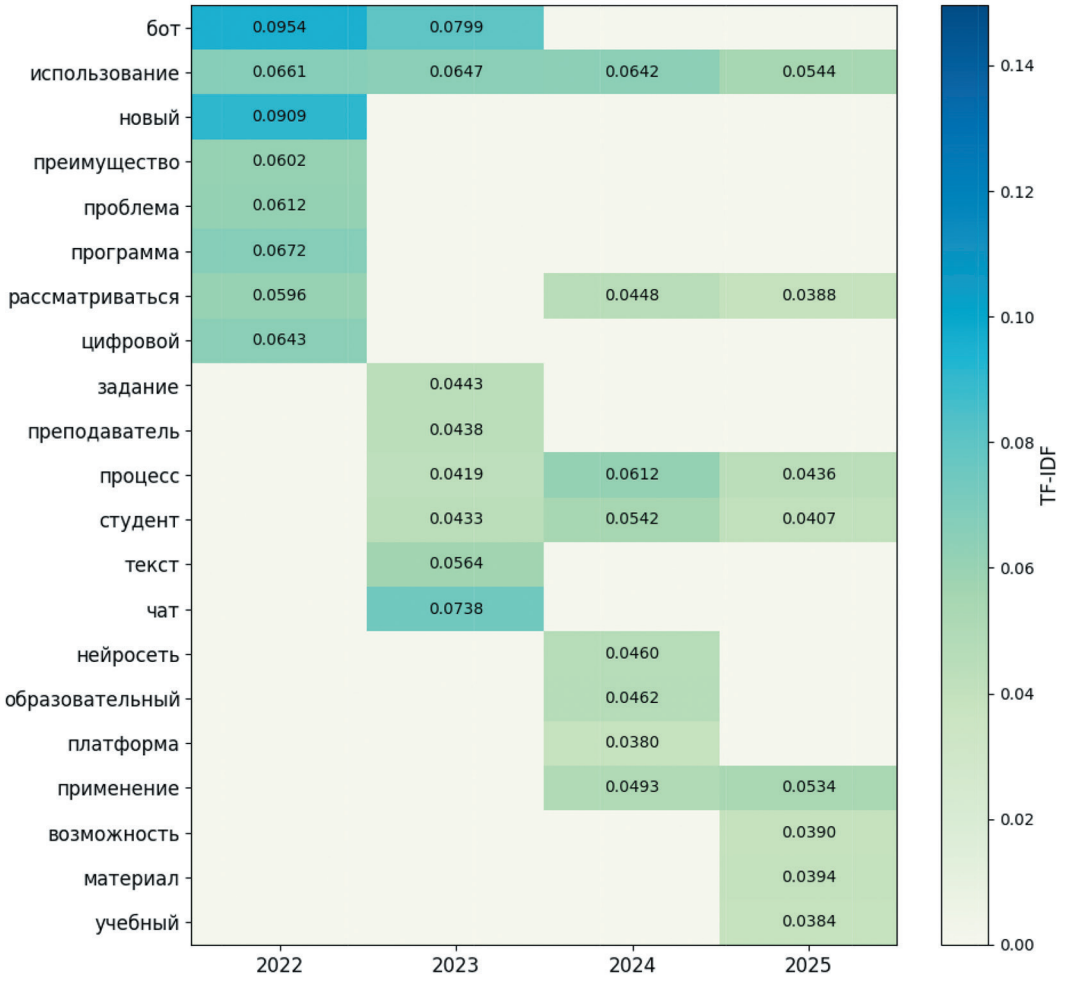

Figure 2. The frequency dynamics of words in the abstracts per year (TF-IDF)

Source: prepared by O.V. Goncharova.

2024 marked a qualitative turn from describing the capabilities of the technology to analyzing its methodological potential. On heat maps, the lexemes "process" (TF-IDF ≈ 0.82), "educational" (TF-IDF ≈ 0.78) and "use"

(TF-IDF ≈ 0.76) reach maximum values; at the same time, the words "frame", "experiment", and "source" appear. The research focuses on designing educational scenarios for teaching Russian, evaluating the stylistic correctness of the generated texts, and first tests of their effectiveness. The clusters demonstrate an increasing proportion of papers describing specific algorithms for embedding AI in exercises in Russian as a foreign language and the results of pilot trials.

Table 1

The results of the thematic modelling of abstracts (NMF, *k* = 5)

Topic	Key lexemes
2025	
1	ideological, critical, assignment, political, text, evaluation
2	learn, gamification, assimilation, material, fascinating, contribute
3	ignorance, attitude, usage, practice, interest
4	role-playing, game, student, occupation, process, method
5	application, educational, teacher, advantage, personal, development
2024	
1	student, process, usage, learning, educational, generative
2	educational, stylistics, promote, especially, the stage, however
3	neural network, application, learning, occupation, framework, described
4	text, assignment, platform, teacher, vocabulary, can
5	source, conduct, help, basic, experiment, bot
2023	
1	bot, chat, student, culture, work, Chinese
2	word, text, chat, task, bot, translate
3	teacher, text, generation, method, usage, automatic
4	digital, educational, environment, development, process, internet
5	bot, implementation, chat, describe, use, means
2022	
1	bot, chat, work, advantage, algorithm, usage
2	digital, mobile, new, example, simple, analog
3	distance learning, educational, quality, give, author, characteristics
4	program, analyze, current, voice, usage, requirement
5	new, trend, problem, current, implementation, progress

Source: prepared by O.V. Goncharova.

By 2025, the research focus had shifted to personalization, motivation, and critical analysis of the socio-pedagogical implications of using AI in Russian language teaching. The abstracts are dominated by "educational" (TF-IDF ≈ 0.81), "material" (TF-IDF ≈ 0.77) and "assessment" (TF-IDF ≈ 0.73); "gamification"

(TF-IDF ≈ 0.65) “adaptive” (TF-IDF ≈ 0.62), “critical” (TF-IDF ≈ 0.59), and “ideological” (TF-IDF ≈ 0.56) appear in key words. Cluster analysis identifies five sustainable areas: critical content analysis, increasing motivation through game methods, changing the role and competencies of teachers because of using AI, developing interactive teaching methods, personalizing learning, and developing adaptive courses. Thus, researchers’ attention is shifting to the impact of AI tools on students’ motivation, pedagogical interaction, and the ethical content of educational materials.

The two heat maps compared reveal a systematic effect: the new terminology is first fixed in abstracts, and only after one or two years migrates to keywords. Thus, the term “neural network” demonstrates TF-IDF ≈ 0.34 in the abstracts of 2023 and reaches TF-IDF ≈ 0.67 in the keywords of 2024.

Combined data of frequency and cluster analysis (Table 2) lead us to the following generalizations. First, there is a clear evolutionary trajectory, from mastering the toolkit (2022) through its integration into the educational process (2023) and methodological optimization (2024) to focusing on humanitarian aspects, motivation, adaptability, critical assessment, and professional competencies (2025). Secondly, the object of research has shifted from technology (bot, chat) to participants of educational process, and then to their personal and professional aspects in the context of learning and teaching the Russian language.

Table 2

The dynamics of research focus in AI in the aspect of teaching Russian as a foreign language (2022–2025)

Year	Dominant areas	Interpretation in the aspect of Russian as a foreign language
2022	bot, chat, program, digital; in clusters, algorithm, remote, trend	The period of the “technological description”. The authors record the emergence of new tools and comprehend their potential; pedagogical problems are predicted
2023	student, assignment, teacher; neural network appears for the first time	The focus shifts to the participants of learning process and its content; the ways of including generative models in tasks are explored, and the first scenarios of automatic text generation are discussed
2024	process, educational, and application go to the top; in clusters, experiment, source	The period of methodological specification: from the question “what can AI do” to the question “how to integrate AI into the learning process”; critical analysis of the quality of generated texts and tests of their effectiveness
2025	educational, material, evaluation; in keywords, gamification, adaptive, critical, ideological	The issues of learning quality, critical understanding of content and socio-pedagogical consequences dominate; technology becomes the background for solving pedagogical and ethical problems; five sustainable areas are formed: working with texts, game mechanics, teacher training, role-based learning, and personalized trajectories

Source: prepared by O.V. Goncharova.

The Shannon index for the terminological diversity of keywords grows steadily: $H_{2022} = 2.83$, $H_{2023} = 3.21$, $H_{2024} = 3.67$, $H_{2025} = 3.91$, which indicates a progressive conceptual differentiation of the research field in the use of AI in teaching Russian as a foreign language.

The graph in Figure 3 visualizes a network of authors' links and citations (n = 352 nodes, e = 748 edges) with modularity Q = 0.72 (Louvain algorithm), indicating strong clustering. The network topology has a clear core-peripheral organization: the central zone (link density > 0.15) concentrate authors with multiple citations, acting as intercluster links; the periphery (density < 0.05) is formed by single-color chains characteristic of small publication series. Color segmentation (Figure 3) corresponds to the modularity classes: nodes with high intragroup connectivity form compact color clusters, while weakly connected components diverge to the periphery.

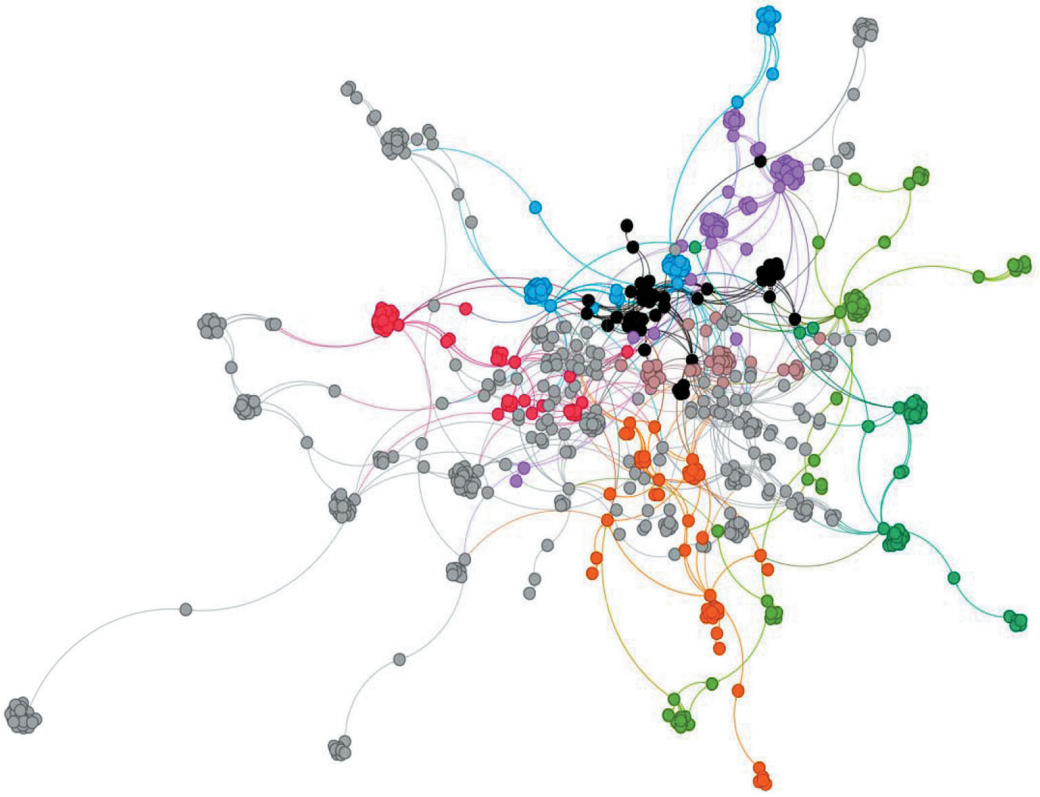

Figure 3. Network visualization of authors' connections and quotations in the articles on AI in Russian as a foreign language (algorithm Louvian)

Source: prepared by O.V. Goncharova.

The thematic interpretation of the clusters, based on nodal attributes, determined the scientific profile of the relevant community (Table 3). In general, the picture points to a segmented field, where the central zone is formed by authors and topics capable of combining methodological, technological and applied areas (primarily the overview and methodological class 0 and practice-oriented class 25), while the periphery reflects stable but local research lines. This structure is consistent with the phase of intensive development of the scientific research field "AI in Russian as a foreign language": a rapid increase

in practices and tools is accompanied by targeted interdisciplinary connections, and the thematic cores eventually consolidate around applied integration and methodological normalization.

Table 3

Thematic interpretation of authors' communities clusters

Colour	Class	Share of nodes, %	Thematic profile
	15	4.27	Development of oral speech skills in an AI-mediated environment; theoretical and methodological conditions, diagnosis, and results
	25	6.82	Implementation of AI and digital services in Russian as a foreign language: designing learning environments, chatbots/applications, usage practices
	13	4.55	Digital transformation of linguodidactics, integration of AI; creative tasks with AI
	7	4.55	Organization of education with AI: master classes, simulators, extracurricular work, and project scenarios
	31	5.31	Innovative methods and models for the formation/evaluation of oral speech with AI support, including gamification and AI
	14	4.74	Digital didactics and lesson rules with AI: techniques, scenarios, tools of the teacher of Russian as a foreign language
	0	4.64	Early and review-methodical texts on ChatGPT/AI: opportunities, risks, limitations, application
	3	3.98	Creation of educational materials and tasks with AI; didactic design and evaluation of products

Source: prepared by O.V. Goncharova.

The results obtained demonstrate not just a change in research topics; they reflect the logic of the development of new technology by the teaching community. The evolutionary trajectory revealed in the study, from instrumental description to methodological integration and further to solving humanitarian and pedagogical problems, finds a convincing explanation within the framework of existing models of digital transformation of education. Thus, the sequence of stages "mastering the toolkit (2022) → integration into the educational process (2023) → methodological optimization (2024) → focusing on humanitarian aspects (2025)" almost completely corresponds to the SAMR model[12], which describes the transition from a simple replacement of traditional tools (Substitution) to their functional improvement (Augmentation), then to the redesign of tasks (Modification) and, finally, to the creation of fundamentally new, previously impossible types of learning activities (Redefinition). The focus on personalization, critical thinking, and motivation revealed in 2025 marks the

[12] Puentedura, R. R. (2013). SAMR: Moving from enhancement to transformation [PDF slides]. Hippasus. Retrieved January 16, 2026, from https://www.hippasus.com/rrpweblog/archives/2013/05/29/SAMREnhancementToTransformation.pdf

transition to the levels of Modification and Redefinition, where technology is no longer an end in itself, but the core of new pedagogical models. This transition is also consistent with the concept of the organizational vector of digital transformation of linguodidactics (Lebedeva, 2023). The author distinguishes between the simple "application of technology" and the "transformation of learning", where technology radically rebuilds principles, processes, and results. Our data clearly show this shift; in 2022–2023, the research focused on the use of AI (chatbots as a substitute for exercises, automatic verification); in 2024–2025, the focus shifted to the transformation of educational models, the development of adaptive systems, hybrid scenarios ("inverted classroom", station rotation) and new types of pedagogical interaction, which directly correlates with the organizational vector highlighted by M.Yu. Lebedeva.

Thus, the revealed dynamics of scientific discourse correlates with the general laws of technology integration in education and reflects the natural path of the Russian as a foreign language scientific and pedagogical community from the stage of mastering new tools to the stage of its deep methodological and didactic transformation.

Conclusion

The field of application of AI in teaching Russian as a foreign language has moved to the stage of strengthening theoretical and practical foundations, where the main issues are the quality of education, equal access to education, and the pedagogical validity of their application. The most important aspect of effectiveness is not the type of AI model used, but the accuracy of its didactic integration and the transparency of the assessment procedures associated with it; at the same time, steady progress is achieved mainly in hybrid formats combining automation with teacher activity. Thus, the nearest prospect of using AI tools in teaching Russian as a foreign language is seen in the transition from issues of technical capability and basic performance to the study of productive ways of implementation and substantiation of their advantages over traditional methods of teaching Russian. Special attention should be paid to the creation of adaptive learning systems capable of dynamically adjusting the content and complexity of tasks based on the analysis of students' cognitive and emotional indicators of. In addition, the development of comprehensive methods for assessing the digital literacy of teachers and students, as well as the study of cross-cultural aspects of the introduction of AI in education, seems to be a promising area. There is considerable potential to explore the possibilities of AI for the formation of new types of language competence, such as the ability to critically evaluate AI-generated content and effectively interact with intelligent assistants in the field of Russian language teaching.

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DOI: 10.22363/2618-8163-2026-24-1-7-24
EDN: XAPPLW

Научная статья

Искусственный интеллект в зеркале современных лингводидактических исследований: корпусно-сетевой анализ

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Аннотация. Современная лингводидактика переживает период фундаментальных технологических преобразований, связанных с интенсивным внедрением технологий искусственного интеллекта (ИИ) в образовательные процессы, что требует комплексного

анализа современного состояния и тенденций развития данного исследовательского поля. Цель исследования — выявить эволюционную траекторию и тематическую структуру научного дискурса, посвященного применению ИИ в обучении русскому языку как иностранному (РКИ), за период с 2022 по 2025 г. Исследование основано на корпусе публикаций, сформированном из открытых источников (CyberLeninka, eLIBRARY). Применены методы библиометрического и контент-анализа, частотный и терминологический анализ на основе TF-IDF, тематическое моделирование, оценка терминологического разнообразия по индексу Шеннона, сетевой анализ с использованием алгоритма Louvain и визуализации ForceAtlas2. Выявлена четкая эволюционная траектория развития дискурса: от описания инструментов и констатации их возможностей (2022) через интеграцию ИИ в учебные задания и сценарии (2023) и методическую оптимизацию (2024) к фокусировке на проблемах мотивации, персонализации обучения и критического анализа социально-педагогических последствий (2025). Сетевая визуализация авторских связей обнаружила сегментированную структуру с ядро-периферийной организацией, включающую четыре ключевые темы: прикладное внедрение ИИ-сервисов, развитие речевых умений, цифровую трансформацию лингводидактики и методическое нормирование практик использования ИИ. Дальнейшее развитие области связано с переходом от вопросов технической возможности к изучению продуктивных способов внедрения ИИ-инструментов в обучение РКИ, созданием адаптивных систем обучения, разработкой методов оценки цифровой грамотности и формированием новых видов языковой компетенции, включая способность к критической оценке AI-генерируемого контента.

Ключевые слова: лингводидактика, русский язык как иностранный, генеративные языковые модели, чат-боты, автоматизированная оценка, корпусный анализ, сетевой анализ, тематическое моделирование

Финансирование. Исследование выполнено в рамках проекта № 050738-0-000 системы грантовой поддержки научных проектов РУДН.

Конфликт интересов. Автор заявляет об отсутствии конфликта интересов.

История статьи: поступила в редакцию 22.06.2025; принята к печати 20.10.2025.

Для цитирования: *Гончарова О.В.* Искусственный интеллект в зеркале современных лингводидактических исследований: корпусно-сетевой анализ // Русистика. 2026. Т. 24. № 1. С. 7–24. http://doi.org/10.22363/2618-8163-2026-24-1-7-24 EDN: XAPPLW