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RESEARCH ARTICLE

Problems of Computational Linguistics in Teaching the Russian Language in Modern Uzbekistan

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Abstract

This article examines the problems of computational linguistics in teaching the Russian language in modern Uzbekistan. The rapid development of digital education, artificial intelligence, corpus technologies, automatic translation systems, speech recognition tools and electronic learning platforms has created new opportunities for language teaching. At the same time, the integration of computational linguistics into Russian language education in Uzbekistan faces a number of methodological, technological, linguistic and sociocultural difficulties. The purpose of the article is to identify the main problems that arise when computational linguistic tools are used in teaching Russian as a second or foreign language in the Uzbek educational context. The study is based on descriptive, analytical, comparative and methodological approaches. The results show that the most important challenges include the lack of localized digital resources, insufficient Russian-Uzbek bilingual corpora, limited adaptation of automatic language processing tools to learners' needs, weak integration of computational methods into teacher training, difficulties in automatic assessment of students' speech and writing, and the risk of excessive dependence on machine translation. The article argues that computational linguistics can significantly improve Russian language teaching only when digital technologies are combined with linguodidactic principles, teacher competence, cultural context and communicative methodology.

KEYWORDS

Computational linguistics, Russian language teaching, Uzbekistan, digital education, corpus linguistics, machine translation, artificial intelligence, language learning technologies, bilingual education, linguodidactics.

INTRODUCTION

The teaching of the Russian language in modern Uzbekistan is developing in a new educational and technological environment. Russian continues to play an important role in intercultural communication, higher education, professional mobility, scientific information exchange and access to Russian-language academic and technical resources. At the same time, the educational system of Uzbekistan is undergoing digital transformation, which creates the need to use modern technological tools in language teaching. Computational linguistics, as a field that studies natural language with the help of computer technologies, offers new possibilities for improving the quality of Russian language education.

Computational linguistics includes a wide range of tools and methods such as electronic corpora, automatic text analysis, machine translation, speech recognition, speech synthesis, grammar checking, automatic assessment, intelligent tutoring systems and natural language processing. These technologies

can support teachers and learners by providing authentic language data, individual feedback, pronunciation training, vocabulary development, text analysis and automated exercises. In theory, computational linguistics can make Russian language teaching more adaptive, interactive and evidence-based.

However, the practical use of computational linguistics in teaching Russian in Uzbekistan is connected with several problems. The first problem is the gap between technological possibilities and pedagogical readiness. Digital tools may exist, but teachers may not always know how to use them methodologically. The second problem is the lack of localized resources that take into account the linguistic background of Uzbek-speaking learners. Russian and Uzbek belong to different language families and differ significantly in grammar, phonetics, word order, morphology and case systems. Therefore, Russian language teaching in Uzbekistan requires digital tools that are adapted to the specific difficulties of Uzbek learners.

Another important issue is bilingual and multilingual context. Many students in Uzbekistan learn Russian not as a completely foreign language, but in a sociolinguistic environment where Russian may be present in media, urban communication, education, family communication or professional fields. This creates both advantages and difficulties. Some learners have passive exposure to Russian, while others face interference from Uzbek or English. Computational tools should be able to support these different learner profiles, but many existing technologies are not designed for such complex linguistic situations.

The relevance of the topic is also connected with the increasing use of artificial intelligence and machine translation in education. Students often use automatic translation systems, online dictionaries, grammar checkers and AI-based writing tools. These resources may help them understand texts and produce written assignments, but they may also reduce independent language practice if used uncritically. Therefore, it is necessary to analyze not only the benefits of computational linguistics, but also its risks and limitations in Russian language teaching.

The purpose of this article is to identify and analyze the main problems of computational linguistics in teaching the Russian language in modern Uzbekistan. The article focuses on linguistic, methodological, technological and pedagogical aspects of the problem. It also discusses how computational linguistic resources can be adapted to the needs of Uzbek learners and how teachers can integrate digital tools into effective language instruction.

The study is based on descriptive, analytical, comparative and methodological approaches. The descriptive method is used to characterize the current role of computational linguistics in language education and to explain the main types of digital tools that may be used in Russian language teaching. This method allows the article to present computational linguistics as a practical resource for teaching grammar, vocabulary, pronunciation, reading, writing and communication.

The analytical method is applied to identify the problems that arise when computational technologies are introduced into Russian language education. These problems are considered at different levels, including language structure, learner needs, teacher competence, digital infrastructure, software localization and assessment. The comparative method is used to interpret the differences between Russian and Uzbek from the point of view of computational language learning. Since Russian and Uzbek have different grammatical systems, automatic tools must be sensitive to the specific interference patterns that Uzbek-speaking learners may demonstrate.

The methodological approach is used to evaluate computational linguistic tools from the perspective of linguodidactics. In language teaching, technology is effective only when it supports learning goals. Therefore, the study examines whether digital tools help students develop communicative competence, grammatical accuracy, lexical richness, pronunciation skills and independent learning strategies. The theoretical basis of the research includes works on computational linguistics, corpus linguistics, language teaching methodology, computer-assisted language learning and Russian as a foreign language.

The study is qualitative in nature. It does not aim to measure statistical indicators, but to systematize the main problems and propose pedagogical interpretations. The analysis is based on typical educational situations in which Russian is taught to Uzbek-speaking students in universities, language courses and digital learning environments.

The analysis shows that one of the main problems of computational linguistics in teaching Russian in Uzbekistan is the lack of localized educational resources. Many Russian language learning platforms are designed for general foreign learners and do not take into account the specific linguistic

difficulties of Uzbek students. Uzbek-speaking learners often face problems with Russian cases, grammatical gender, aspectual pairs of verbs, agreement, prepositions, stress and pronunciation of certain consonant clusters. If digital tools do not diagnose these difficulties accurately, they cannot provide useful feedback. For example, a general grammar checker may detect an incorrect form, but it may not explain why the mistake is typical for Uzbek learners.

Another serious problem is the limited development of Russian-Uzbek parallel and learner corpora. Corpus linguistics is one of the most useful areas of computational linguistics for language teaching because it provides real examples of word usage, collocations, grammatical constructions and discourse patterns. However, for teaching Russian in Uzbekistan, it is not enough to have only large Russian corpora. Teachers and researchers also need bilingual corpora, parallel texts, learner corpora and databases of typical errors made by Uzbek-speaking students. Such resources would help create more accurate textbooks, digital exercises, automatic feedback systems and translation tools.

Machine translation is widely used by students, but it creates both opportunities and risks. Automatic translation systems can help learners understand difficult texts, compare structures and expand vocabulary. However, many students use machine translation as a replacement for independent writing. This leads to superficial learning and reduces the development of productive language skills. In addition, machine translation may produce grammatically correct but stylistically unnatural sentences. It may also fail to reflect contextual meaning, idiomatic expressions and cultural nuances. In Russian language teaching, this problem is especially important because students may submit translated texts without understanding their structure.

Speech recognition and pronunciation training tools also face limitations. Russian pronunciation includes stress patterns, vowel reduction, soft and hard consonants, intonation and rhythm. Uzbek-speaking learners may experience difficulties with these features because Uzbek phonetics differs from Russian phonetics. Automatic speech recognition systems may not always correctly evaluate the speech of learners with a strong accent. If the system is trained mainly on native Russian speech, it may misrecognize learner pronunciation and provide inaccurate feedback. Therefore, pronunciation technologies must be adapted to non-native speech and specific learner groups.

Automatic assessment of written texts is another problematic area. Russian writing requires correct morphology, syntax, punctuation, lexical choice and stylistic coherence. Computational tools can detect some spelling and grammar errors, but they often cannot fully evaluate communicative quality, argumentation, text logic or pragmatic appropriateness. For Uzbek learners, this limitation is significant because errors may be caused not only by lack of grammar knowledge, but also by transfer from Uzbek sentence structure. An automatic system may mark an error but fail to explain the underlying cause.

The use of artificial intelligence in Russian language education also raises methodological questions. AI-based chatbots and writing assistants can simulate conversation, generate exercises and provide explanations. However, they may sometimes produce inaccurate examples, oversimplified rules or culturally inappropriate responses. If teachers and students use AI tools without critical evaluation, errors may become part of learning. Therefore, AI must be used under pedagogical control and should not replace teacher guidance.

The analysis also reveals that many teachers lack sufficient training in computational linguistics and digital pedagogy. A teacher may know Russian language methodology well, but may not be able to use corpora, digital dictionaries, annotation tools, automated testing systems or AI-based platforms effectively. The problem is not only technical, but methodological. Teachers need to understand how a digital tool supports a specific learning objective. Without this understanding, technology may become a decorative element rather than an effective teaching instrument.

Digital inequality is another important issue. Not all educational institutions have equal access to high-quality internet, modern devices, licensed software and digital learning platforms. Some students may have personal access to smartphones and online tools, while others may depend only on classroom resources. This difference affects the effectiveness of computational linguistic technologies. If digital resources are introduced without considering access and infrastructure, they may increase inequality instead of improving education.

The results show that computational linguistics has great potential for teaching Russian in Uzbekistan, but this potential can be realized only through systematic adaptation. Digital tools should not be imported mechanically from other educational contexts. They must be localized according to the

linguistic, cultural and methodological needs of Uzbek learners. This means that Russian language technologies should include Uzbek-language explanations, contrastive grammar materials, examples of typical errors, bilingual dictionaries, pronunciation models and learner-oriented feedback.

The development of Russian-Uzbek corpora is one of the most important tasks. Parallel corpora can help students compare sentence structures and understand translation equivalents. Learner corpora can help teachers identify frequent mistakes and design targeted exercises. Specialized corpora can support teaching Russian for professional purposes, such as economics, medicine, engineering, tourism or international communication. Such resources would make language teaching more evidence-based and more responsive to real learner needs.

Machine translation should be integrated into teaching carefully. It should not be prohibited completely, because it is already part of students' digital reality. Instead, teachers should teach students how to use translation tools critically. Students can compare machine translation with human translation, identify errors, analyze grammatical structures and improve the translated text. In this way, machine translation becomes a learning resource rather than a substitute for learning.

Artificial intelligence tools can also support Russian language teaching if they are used purposefully. Chatbots can provide conversational practice, generate situational dialogues and offer additional explanations. However, teachers must verify the quality of AI-generated content. AI should support communication, feedback and practice, but it should not replace systematic grammar explanation, cultural interpretation or teacher-student interaction. The teacher remains responsible for the pedagogical quality of the learning process.

The problem of teacher training is central. Computational linguistics should become part of professional development programs for Russian language teachers. Teachers need practical skills in using corpora, electronic dictionaries, online testing systems, speech tools and AI-based applications. They also need methodological competence to select technologies according to the goals of a lesson. Digital literacy should be connected with linguodidactic thinking.

The integration of computational linguistics into Russian language teaching also requires cooperation between linguists, programmers, teachers and educational institutions. Effective digital tools cannot be created by programmers alone, because they must reflect linguistic structure and pedagogical logic. At the same time, teachers need technical support to implement digital resources. Interdisciplinary cooperation is therefore necessary for creating localized and reliable educational technologies.

It is also important to preserve the communicative purpose of language learning. Computational tools can analyze, correct and generate language, but language is not only a formal system. Students learn Russian in order to communicate, understand texts, participate in dialogue, study professional literature and interact with people. Therefore, computational linguistics should support communicative competence, not reduce learning to mechanical exercises. The best results can be achieved when digital tools are combined with live communication, discussion, reading, writing and cultural learning.

Computational linguistics creates important opportunities for teaching the Russian language in modern Uzbekistan. Corpus technologies, machine translation, speech recognition, grammar checking, automatic assessment and artificial intelligence can support individualized learning, improve feedback, expand access to authentic materials and increase the effectiveness of language education. However, their use is connected with serious problems.

The main difficulties include insufficient localization of digital resources, lack of Russian-Uzbek learner corpora, limited adaptation of speech recognition tools to Uzbek-speaking learners, risks of excessive dependence on machine translation, imperfect automatic assessment and insufficient teacher training in computational linguistics. These problems show that technology alone cannot solve the challenges of Russian language teaching.

The effective use of computational linguistics requires a systematic approach. Digital tools must be adapted to the Uzbek educational context, integrated with communicative methodology and supported by teacher training. Special attention should be paid to the creation of Russian-Uzbek corpora, bilingual digital dictionaries, learner error databases, localized grammar platforms and AI tools designed for Russian language education in Uzbekistan. Only in this case can computational linguistics become a real factor in improving the quality of Russian language teaching and developing students'

linguistic and communicative competence.

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