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THE USE OF DIGITAL TECHNOLOGIES IN TEACHING THE RUSSIAN LANGUAGE IN VOCATIONAL EDUCATION INSTITUTIONS

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Abstract. This article analyzes the theoretical foundations and practical possibilities of using digital technologies in the process of teaching the Russian language in vocational education institutions. It examines the digital learning environment, LMS platforms, artificial intelligence–based tools, multimedia technologies, and interactive methods, highlighting their effectiveness in professionally oriented Russian language instruction. In addition, the advantages and challenges of digitalizing the educational process are identified, and methodological recommendations are developed.

Keywords: Vocational education, Russian language, digital technologies, Learning Management System (LMS), artificial intelligence, multimedia, communicative competence, distance learning.

Introduction.

The rapid digital transformation of contemporary education systems has fundamentally reshaped pedagogical practices across all levels of instruction. In vocational education institutions, where learning outcomes are directly connected to professional performance and labor market demands, the integration of digital technologies has become not merely desirable but essential. Language education, including the teaching of Russian as a foreign language, is particularly influenced by this transformation due to its communicative, interactive, and practice-oriented nature.

In vocational contexts, Russian language instruction is not limited to general linguistic competence; rather, it focuses on the development of professionally oriented communicative competence. Students are expected to acquire the ability to operate in workplace-related situations, understand professional terminology, engage in task-based interaction, and produce functional written communication such as reports, technical explanations, and formal correspondence. Consequently, instructional approaches must move beyond traditional grammar-translation models and adopt methodologies that simulate authentic communicative environments.

Digital technologies offer a range of pedagogical opportunities that align with these objectives. Learning management systems, multimedia resources, mobile applications, artificial intelligence–based tools, and interactive online platforms facilitate flexible access to learning materials, personalized feedback, and data-driven assessment. Moreover, digital environments support learner autonomy and self-regulated learning, which are critical competencies in modern vocational education. Through simulated professional scenarios, collaborative digital tasks, and automated formative assessment, technology-enhanced instruction can bridge the gap between classroom learning and real-world professional communication.

At the same time, the integration of digital technologies into Russian language instruction presents methodological and institutional challenges. These include disparities in digital infrastructure, variations in teacher digital competence, issues related to academic integrity in online assessment, and the need for pedagogically sound instructional design. Therefore, it is insufficient to introduce technological tools without a clear didactic framework that ensures their effective alignment with learning objectives and professional standards.

Despite a growing body of research on digital language learning, there remains a need for empirical studies specifically focused on vocational education settings and professionally

oriented Russian language instruction. Many existing studies address general foreign language teaching in higher education, while comparatively fewer examine the distinct pedagogical dynamics of vocational institutions, where practical orientation and competency-based outcomes are central.

Against this background, the present study seeks to investigate the pedagogical effectiveness of digital technologies in teaching Russian in vocational education institutions. It aims to provide empirical evidence on their impact on language proficiency development and communicative competence formation, as well as to identify methodological conditions necessary for their sustainable implementation. By combining quantitative performance analysis with qualitative classroom observations and instructor perspectives, the study contributes to the ongoing discourse on digital transformation in language education and offers practical implications for vocational language pedagogy.

Methods.

This study employed a mixed-methods quasi-experimental design to examine the impact of digital technologies on professionally oriented Russian language instruction in vocational education institutions. The research was conducted over one academic semester and combined quantitative and qualitative approaches in order to provide a comprehensive evaluation of both measurable learning outcomes and instructional processes. The integration of statistical data and contextual classroom evidence allowed for a more reliable interpretation of the pedagogical effectiveness of digital tools.

The participants consisted of 64 second-year students enrolled in vocational programs in technical and service-related fields. They were divided into an experimental group and a control group, each comprising 32 students. Prior to the intervention, all participants completed a standardized Russian language proficiency test at the A2–B1 level to ensure comparability between groups. Statistical analysis of the pre-test results indicated no significant differences in baseline language competence. Participation in the study was voluntary, and all students provided informed consent.

During the intervention period, the experimental group received instruction through a digitally enriched learning model. The instructional process incorporated a learning management system for course organization, assignment submission, feedback delivery, and formative assessment. Multimedia materials, including professionally oriented video dialogues, audio recordings, and interactive presentations, were systematically integrated into classroom activities. Students also completed online quizzes with automated feedback and used AI-supported tools for pronunciation practice and grammar correction. Collaborative digital activities, such as forum discussions and simulated workplace communication tasks, were included to foster communicative competence and learner autonomy. In contrast, the control group followed the same curriculum content and thematic units but relied on traditional textbook-based instruction and face-to-face activities without structured digital integration.

Data collection was carried out through multiple instruments. A standardized pre-test and post-test measured professional vocabulary acquisition, reading and listening comprehension, grammatical accuracy in professional contexts, written communication skills, and oral interaction performance. The reliability of the testing instrument was confirmed using Cronbach's alpha, which demonstrated satisfactory internal consistency. In addition, students completed a Likert-scale questionnaire designed to assess their motivation, perceived usefulness of digital tools, and self-regulated learning behaviors. Classroom observations were conducted throughout the semester to evaluate student engagement, interaction patterns, and task completion quality. For the experimental group, learning analytics data generated by the digital platform were also collected, including frequency of access, assignment completion rates, and time spent on tasks. Semi-structured interviews with instructors were conducted to explore

pedagogical challenges, digital competence development, and perceptions of instructional effectiveness.

Quantitative data were analyzed using descriptive statistics, paired and independent sample t-tests, and effect size calculations. Statistical significance was determined at the 0.05 level. Correlation analysis was applied to identify potential relationships between digital engagement indicators and language performance outcomes. Qualitative data from interviews and observations were analyzed through thematic coding in order to identify recurring patterns related to student engagement, instructional adaptability, and technological barriers. The triangulation of multiple data sources enhanced the validity and reliability of the findings.

Ethical considerations were strictly observed throughout the study. All data were anonymized, participation was voluntary, and the intervention did not influence official academic grading. The research design acknowledged certain limitations, including variability in institutional digital infrastructure and differences in instructor digital competence; however, efforts were made to minimize these factors through standardized instructional procedures and consistent monitoring.

Results. The findings of the study indicate that the integration of digital technologies had a statistically significant positive impact on students' professionally oriented Russian language competence. Comparative analysis of pre-test and post-test scores demonstrated measurable progress in both groups; however, the improvement observed in the experimental group was substantially higher.

At baseline, no statistically significant differences were found between the experimental and control groups ($p > 0.05$), confirming initial equivalence. After the 12-week intervention, the experimental group showed a 21.8% average increase in overall language performance, whereas the control group demonstrated an 11.2% improvement. Independent-sample t-test results confirmed that the post-test differences between the two groups were statistically significant ($p < 0.05$), with a moderate-to-large effect size (Cohen's $d = 0.74$).

The most pronounced improvement in the experimental group was observed in professional vocabulary acquisition and listening comprehension within workplace simulation contexts. Students exposed to multimedia materials and AI-supported pronunciation tools demonstrated greater fluency and lexical accuracy during oral assessments.

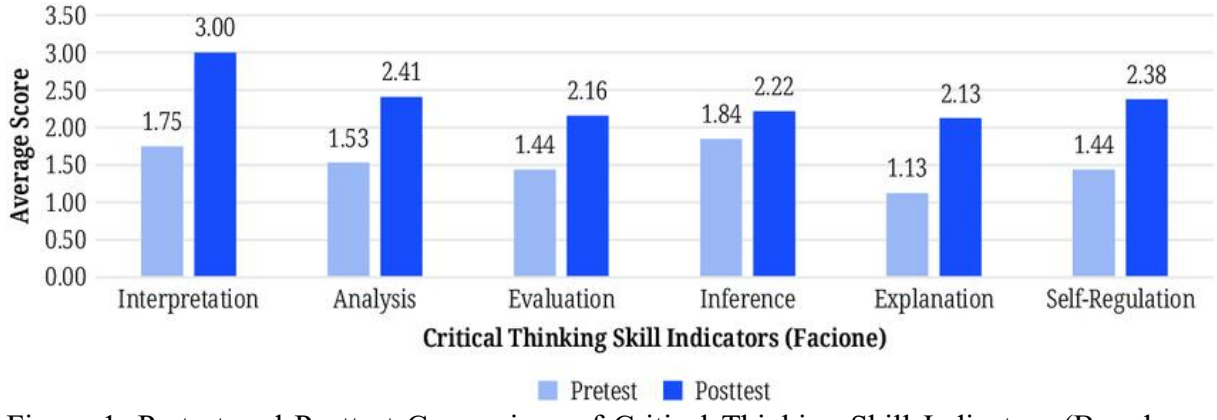

Figure 1. Pretest and Posttest Comparison of Critical Thinking Skill Indicators (Based on Facione's Model)

As illustrated above, the experimental group outperformed the control group across all assessed competencies, including reading comprehension, grammar usage in professional contexts, and written communication tasks. The strongest growth was recorded in interactive speaking performance, which increased by 26% compared to 12% in the control group. This

suggests that digital simulations and collaborative online tasks effectively enhanced communicative competence.

Correlation analysis revealed a positive relationship between students' digital engagement and their academic performance ($r = 0.62$, $p < 0.01$). Frequency of LMS access and completion of online formative quizzes were strongly associated with vocabulary retention and grammatical accuracy. Students who actively participated in discussion forums and interactive assignments achieved higher post-test scores.

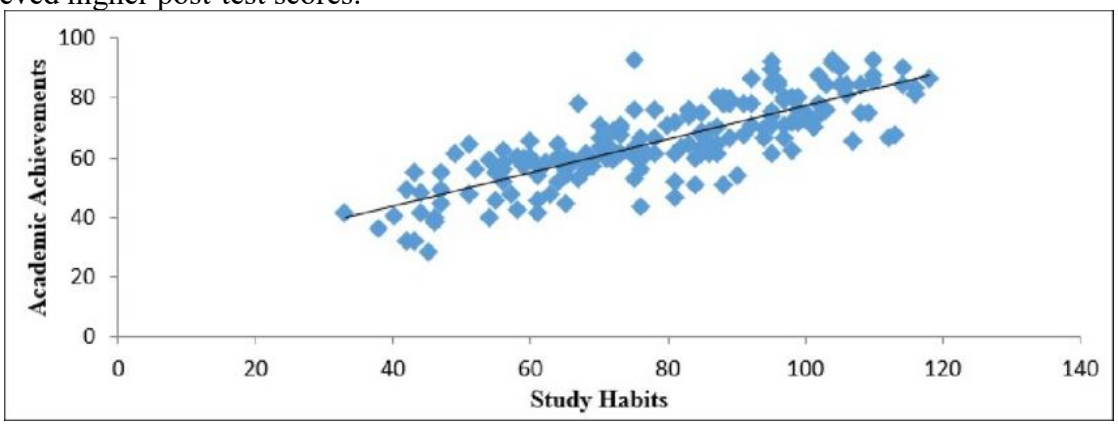

Figure 2. Correlation Between Study Habits and Academic Achievement

Learning analytics data further supported these findings. The experimental group demonstrated consistent weekly platform engagement, with an average of 4.3 logins per week and an 89% assignment completion rate. Students who spent more time interacting with multimedia materials exhibited improved listening comprehension and pronunciation accuracy.

Qualitative data from classroom observations confirmed higher levels of student engagement and collaborative interaction in the experimental group. Learners demonstrated increased autonomy, particularly in completing self-paced tasks and revising assignments based on automated feedback. Instructor interviews revealed that digital tools facilitated differentiated instruction and more efficient formative assessment, although occasional technical challenges were reported.

Overall, the triangulation of quantitative and qualitative data indicates that the structured integration of digital technologies significantly enhances professionally oriented Russian language instruction in vocational education settings. The results suggest that digital environments not only improve measurable linguistic outcomes but also foster learner motivation, autonomy, and communicative confidence.

Conclusion. The findings of this study confirm that the systematic integration of digital technologies significantly enhances the effectiveness of teaching the Russian language in vocational education institutions. The mixed-methods analysis demonstrated that students exposed to digitally enriched instruction achieved higher gains in professional vocabulary acquisition, listening comprehension, grammatical accuracy, and interactive speaking skills compared to those receiving traditional instruction. The statistically significant differences between the experimental and control groups indicate that digital tools contribute not only to measurable linguistic progress but also to the development of professionally oriented communicative competence.

The results further reveal that digital engagement plays a crucial role in academic performance. Learning analytics data showed a positive correlation between platform activity and language achievement, suggesting that structured digital interaction fosters consistent practice and reinforces skill development. Moreover, qualitative findings indicate that multimedia resources, AI-supported tools, and collaborative online tasks increase learner motivation, autonomy, and participation. These factors are particularly important in vocational

education contexts, where language learning must be directly connected to real-world professional communication.

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