INFORMATIZATION OF EDUCATION: A GLOBAL PERSPECTIVE

ГЛОБАЛЬНЫЕ АСПЕКТЫ ИНФОРМАТИЗАЦИИ ОБРАЗОВАНИЯ

Features of using information technologies in teaching French as a native and foreign language in schools in France, Canada, Morocco, and Russia

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Abstract. *Problem statement.* France, Canada, Morocco and Russia have different unique experiences of using information technologies (IT) in teaching French to school students. At the same time, the digital educational resources used in these countries accommodate diverse approaches and methodologies for teaching. Against this backdrop, a key problem is the near absence of comparative analysis examining how modern information technologies are employed in French language education across different countries. It is advisable to identify best practices and, based on these findings, develop recommendations for optimizing relevant teaching approaches in Russian schools. *Methodology.* The study employs a comparative analysis of existing approaches to teaching French and using IT across different countries, development of corresponding recommendations for Russian schools and experimentally verifying the effectiveness of the proposed approaches and digital resources. *Results.* The digital educational resources have been rated in compliance with the defined evaluation criteria. The comparative analysis results yielded recommendations for implementing IT in Russian schools based on international experience and the conducted pedagogical experiment confirmed the hypothesis that examining approaches and comparatively analyzing the specifics of using information technologies in teaching French as both a native and foreign language in Francophone countries (France, Canada, and Morocco) and taking into account the results of such an analysis when improving the methodological system of teaching French in Russia enhances the effectiveness of student preparation. *Conclusion.* The study established criteria for a comparative analysis of the use of IT in French language education across different countries, which made it possible to identify the specifics of their use in France, Canada, Morocco and Russia. Based on these results, recommendations have been developed to enhance the methodological framework for

teaching French in Russian schools. It has been experimentally confirmed that the use of IT based on international experience enhances student learning outcomes.

Особенности использования информационных технологий в обучении французскому языку как родному и иностранному в школах Франции, Канады, Марокко и России

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Аннотация. *Постановка проблемы.* Франция, Канада, Марокко и Россия обладают различным уникальным опытом использования информационных технологий (ИТ) в обучении школьников французскому языку. При этом образовательные электронные ресурсы, применяемые в этих странах, учитывают различные направления и способы обучения. Однако практически полностью отсутствует сравнительный анализ особенностей использования современных ИТ в обучении французскому языку в разных странах. Целесообразно выявить лучшие практики и на их основе разработать рекомендации по оптимизации соответствующих подходов для российских школ. *Методология.* Применяется сравнительный анализ имеющихся способов обучения французскому языку и использования ИТ в разных странах, разрабатываются соответствующие рекомендации для российских школ, а также эксериментально проверяется эффективность предлагаемых подходов и цифровых ресурсов. *Результаты.* Образовательные электронные ресурсы оценены в соответствии с выделенными критериями. В результате даны рекомендации по использованию ИТ в российских школах с учетом международного опыта, а проведенный педагогический эксперимент подтвердил гипотезу, что изучение опыта и сравнительный анализ специфики использования ИТ в обучении французскому языку как родному и иностранному во Франции, Канаде и Марокко как франкоговорящих странах, учет результатов такого анализа при совершенствовании методической системы обучения французскому языку в России способствуют повышению эффективности соответствующей подготовки обучающихся. *Заключение.* В ходе исследования сформулированы критерии для сравнительного анализа использования ИТ при обучении французскому языку в разных странах, что позволило выявить особенности их применения во Франции, Канаде, Марокко и России. На основе этих результатов разработаны рекомендации по совершенствованию методической системы обучения французскому языку в россий-

ских школах. Экспериментально подтверждено, что использование ИТ на основе учета международного опыта повышает эффективность подготовки учащихся.

Ключевые слова: образовательные электронные ресурсы, средства обучения, сравнительный анализ, критерии сравнения электронных ресурсов, конспект урока

Problem statement. Information Technology has rapidly evolved into a significant component of modern society's life and activities. Today, many countries regard understanding these technologies and mastering their fundamental concepts as an integral part of basic education, on par with reading, writing, and arithmetic.

In contemporary Russian schools, the use of IT in teaching is becoming a commonplace component of the educational process, opening new opportunities for enhancing the quality and accessibility of education. However, for the effective application of these technologies, it is essential to consider international experience, which demonstrates successful practices and innovative approaches, including those in foreign language teaching.

The methodological foundations and conceptual frameworks for the application of new information technologies in education have been explored by scholars such as Ya.A. Vagramenko [1], K.K. Kolin [2], E.S. Polat [3], among others. The development and implementation of software and methodological complexes for organizing instruction in educational institutions using new information technologies were the focus of work by T.A. Boronenko [4], A.P. Ershov [5], and A.E. Maron [6]. Meanwhile, issues of pedagogical support for the use of new information technologies in learning, including challenges related to corresponding teacher training, were addressed by S.A. Beshenkov [7], Yu.S. Branovsky [8], V.V. Grinshkun [9;10], L.Yu. Monakhova [6], and others.

Foreign language training represents an area of the education system where IT can fundamentally transform both teaching methods and educational outcomes. This potential has been noted by many domestic scholars, including A.G. Oleynik [11], E.S. Polat [12; 13], and I.V. Robert [14].

The selection of France, Canada, and Morocco for examination within this study, which is dedicated to improving French language instruction, is justified by their historical ties to the language, the extensive scope of its dissemination, and the differences in the status of the French language within each country.

In France, French is the native language, which allows for an investigation into the application of IT in its instruction from the perspective of cultural identity and traditions. As a bilingual country, Canada presents a compelling case for studying

the use of information technologies in teaching French, potentially enabling the identification of specific features that distinguish its application from English language teaching, and vice versa. In Morocco, the primary language is Arabic, while French is not an official language but holds the status of a second language. It is widely used in education and business. The experience of integrating IT into the educational process for teaching French writing, phonetics, and grammar is of particular interest due to the language's significant dissimilarity from the native language of Moroccans. It is important to study the existing educational electronic resources in these countries to adapt and utilize best practices for teaching the French language in Russia.

Thus, the relevance of this study is driven by the rapid development of information technologies and their penetration into all spheres of life, including education. The use of information technology in teaching foreign languages in schools, particularly French, is becoming increasingly popular and in demand. Against this backdrop, a significant *problem* is the near-total absence of a comparative analysis of the specifics of using modern information technologies in teaching the French language within the general education systems of different countries. It is, therefore, advisable to identify best practices and, on this basis, develop recommendations for optimizing the relevant approaches in the Russian Federation.

The aim of the research conducted and described in this article is to perform a comparative analysis of the specific features of using information technologies in teaching French as both a native and a foreign language in France, Canada, Morocco, and Russia. A further objective, based on the results of this analysis, is to formulate recommendations for enhancing the effectiveness of French language instruction using IT in Russian schools.

Methodology. The study involves an analysis of the theoretical aspects of using IT in the field of foreign language education. This analysis is grounded in the fact that the development of IT has a rich history in science, and the term 'information technology' itself carries varying definitions depending on the context. The research considers that in the sphere of education, IT is transforming instructional approaches. Such technologies encompass the use of computers, software, the Internet, etc., to enhance the effectiveness of the educational process.

The study acknowledges the evolution of teaching aids in foreign language instruction, from audiovisual tools such as tape recorders and projectors to modern online platforms and mobile applications. Audiovisual teaching methods laid the groundwork for the integration of IT into language teaching, and the advent of computers and the Internet expanded opportunities for interactive and distance learning.

Modern technologies, such as distance learning platforms, video conferencing, and mobile applications, have made language learning more accessible and interactive. While these technical tools offer several advantages, certain disadvantages exist, including technical challenges and over-reliance on technology. Nevertheless, information technologies continue to transform the foreign language learning process, offering new ways of interaction and enhancement of language skills.

Instruction in French as a native language emphasizes adherence to linguistic norms and rules established by official governing bodies. The learning process involves mastering orthography, grammar, and style, as well as developing reading comprehension, text analysis, and written expression skills. In bilingual countries, instruction also considers the interaction between French and other languages, which requires additional attention to the specific features of the language.

The research considers that several approaches to teaching French as a foreign language exist, including the traditional grammar-translation method, the communicative approach, project-based learning, and intensive instruction, each of which emphasizes different aspects of the learning process.

The study employs a comparative analysis of existing methods for teaching French and applying IT across different countries. This is followed by the development of corresponding recommendations for Russian schools and the experimental testing of the effectiveness of the proposed approaches and digital resources.

Results and discussion. The integration of IT into the educational process has become a priority in the 21st century across all the countries under study. Governments actively support this process and direct their policies toward developing students' digital skills and integrating technology into instruction. For instance, France has implemented the *Digital Technologies for Education 2023–2027* strategy; Canada invests in IT projects such as *MétaLingo* and *Voilà Learning*; Morocco has initiated the *GENIE*, *NAFIDA*, and *Maroc Numeric* programs; and Russia is implementing the federal project *Digital Educational Environment*.

In French schools, digital platforms are widely used to provide access to educational materials, support school administration, and facilitate communication among participants in the educational process. The Ministry of National Education actively supports the development and dissemination of digital educational resources, such as *Éduthèque* and *BRNE* (Banque de Ressources Numériques pour l'École), enabling teachers to adapt materials to their students' needs. Platforms like *Édubase* and *TraAM* (Travaux Académiques Mutualisés) foster the sharing of pedagogical practices and resources among educators. For French language instruction, innovative digital resources such as *Orthonémo*, *Ridisi*, and *Corneille* are employed. These tools exemplify the use of technology to enhance students' writing and reading skills through interactive and adaptive learning approaches.

French holds a significant place in Canada's educational system as one of the country's two official languages. In 2023, the Canadian government approved a new action plan for official languages, which includes substantial investments to ensure the equal status of English and French. Regarding French language education, Canada actively develops immersion programs and French as a Second Language (FSL) instruction. Canadian schools are integrating information technologies into teaching, ranging from interactive whiteboards and online platforms such as *Google Read and Write*, *Conjuguemos*, and *BonPatron*, to metaverse technologies like the *MétaLingo* project. These innovations contribute to more effective learning and enhanced interaction between students and teachers. According to statistics, 79% of Canadian teachers consider technology essential for lesson preparation, as

it facilitates the learning process for students and helps educators adapt to diverse student abilities. However, Canada also faces challenges, including disparities in IT infrastructure across schools and insufficient training for teachers in effectively utilizing new technologies.

In Morocco, despite lacking official language status, French retains significant importance in education and is widely used in schools. France actively participates in supporting French language education in the Kingdom: from 2010 to 2023, a notable increase has been observed in the number of educational institutions and students within the network of French schools. Morocco is implementing ambitious national initiatives, such as the *GENIE*, *NAFIDA*, and *Maroc Numeric* programs, aimed at integrating information technologies into the educational process. For teaching French, computer programs and applications are utilized, though these are predominantly developed outside Morocco. The use of the digital resource *TV5Monde*, and telecommunication platforms like *Parlons français, c'est facile* and *France Université Numérique* is expanding. These platforms host courses in French as a Foreign Language (FLE), which can assist beginners in mastering the fundamentals of French. The assignments from such courses can be effectively employed in teaching school students.

In Russia, state initiatives aimed at integrating information technologies into the educational process support the modernization of teaching methods, including the instruction of French. Regarding the application of IT in teaching French, both domestically developed and foreign products are utilized. Examples include the set of interactive French textbooks *Débutant A0 et A1*, developed by Nizhny Novgorod State Linguistic University, and the educational series *Extra*, among others. Online resources such as the collections of the *Russian Electronic School* (*Rossiyskaya Elektronnaya Shkola*) and the *Moscow Electronic School* (*Moskovskaya Elektronnaya Shkola*) are widely popular. These platforms are designed to facilitate comprehensive familiarity with all aspects of the French language.

Thus, each of the four countries under investigation pursues a policy of integrating IT into education, while implementing diverse projects. In teaching the French language, both domestically developed technologies and those recognized worldwide are utilized.

To conduct a comparative analysis and develop recommendations for the use of information technologies in teaching French to school students, the study has identified several criteria and methods for comparing the capabilities and advantages of such technologies.

Educational digital resources are evaluated according to the following criteria: 0 – does not meet the criterion; 1 – some components of the resource meet the criterion; 2 – the entire resource meets the criterion.

As part of the comparative analysis of educational electronic resources, a table (Table 1) has been constructed. In this table, such resources are grouped by country and evaluated according to the proposed criteria, while a general characterization of the resources from each of the studied countries is also provided. To date, twenty-two digital educational resources have been examined.

Comparative analysis of educational digital resources across different countries that are important for teaching French

Country	Educational Digital Resource	Evaluation criteria*								General characteristics
		Interactivity	Educational content creation feature	Phonetics training applicability	Availability of material for teaching the culture and geography of the country	Learner-teacher and/or other learners online communication capabilities	Self-directed learning possibility	Availability of automation subsystems for the assessment of educational outcomes	Adaptability to individual learner needs	
France	ENT	1	2	1	0	1	1	0	0	In-depth study of rules and exceptions. Culture- and history-based examples from France. Most materials are developed by native speakers
	Orthon mo	2	2	1	0	0	2	2	0	
	Ridisi	1	2	1	1	1	1	0	1	
	Corneille	2	0	1	1	0	2	2	2	
	duNum	0	0	1	1	0	1	0	0	
	TraAM	0	1	1	1	0	1	0	1	
	dubase	0	1	1	1	0	1	0	1	
Canada	Voil Learning	1	1	0	1	1	1	1	1	Integration of English and French language instruction, utilizing adapted versions of validated English-language teaching materials for French language education. The materials include culture- and geography-based examples from Francophone regions of Canada. Exposure to regional dialectal and lexical specificities
	M taLingo	2	0	0	1	2	1	0	1	
	Google Read and Write	1	0	1	1	1	1	1	0	
	Conjuguemos	2	1	0	0	0	2	2	1	
	Seesaw	1	1	1	1	1	1	1	1	
	BonPatron	1	0	0	0	0	1	2	1	
	Google Classroom	2	1	1	1	2	1	1	0	
Morocco	Frantastique	2	0	1	1	0	2	2	2	Primary focus on learning phonetics and writing the characters of the French alphabet
	Podcast fran ais facile	0	0	1	1	0	1	0	0	
	Teachapp	1	1	1	0	0	1	0	0	
Russia	MESH	1	2	1	1	1	1	1	1	Availability of explanations and comparisons in Russian, focus on the Federal State Educational Standard. Examples adapted to the culture, history, and geography of Russia
	RESH	1	2	1	1	1	1	1	1	
	Debutant A0 и A1	1	0	1	1	0	2	2	1	
	TV5Monde	2	0	1	1	0	2	1	1	
	TV series Extra	0	0	1	1	0	2	0	0	

*Note: 0 – does not meet the criterion;

1 – partially meets the criterion (not all components comply);

2 – fully meets the criterion.

Source: compiled by Ekaterina S. Yakovleva.

The analysis of approaches to using information technologies in teaching French in the schools of the specified countries enables the development of

recommendations for Russian educational institutions. To formulate and describe such recommendations, the study has categorized types of learning activities, and for each recommended digital educational resource, a specific component has been identified as a corresponding example. The developed recommendations are presented in an abbreviated form in Table 2.

Table 2

Recommendations on the use of educational digital resources in French language instruction by type of learning activity

Type of learning activity	Recommended educational digital resource	Country	Resource component	Commentary
Grammar instruction	Orthon mo	France	Flashcards for memorizing the spelling of new words	The use of new words in the lesson to practice spelling
	Debutant A0 и A1	Russia	Interactive activities for noun-adjective agreement practice	Recommended for practicing agreement rules
	Conjuguemos	Canada	Verb conjugation mini-game for comprehensive tense/mood practice	Possibility for individual at-home practice and self-guided classroom training
	BonPatron	Canada	Exercises offered by the platform after finding a mistake made in the text	The platform offers exercises for training based on previous mistakes
	RESH	Russia	Interactive training exercises	Using *Moscow-Paris flight* lesson materials to introduce the Subjunctive mood
Phonetics instruction	Corneille	France	Audio tracks with speech accuracy assessment capability	Possibility for individual student phonetics practice
			Video sequence with pronunciation of letters and letter combinations	Use for speech warm-up in the lesson's initial phase
	Podcast fran ais facile	Morocco	Set of illustrations demonstrating labio-nasal articulation positioning	Recommended for use as a speaking warm-up activity before the main lesson
	Orthon mo	France	Pronunciation and memorization flashcards for difficult words	Use for practicing pronunciation and spelling of words
	TV5Monde	Russia	Authentic materials (videos) from TV shows	Recommended for pronunciation training
Teaching speaking skills	Voil Learning	Canada	Platform functionality	Use to practice dialogic speech skills through communication on the platform during extracurricular time
	Google Read and Write	Canada	Voice recording subsystems	Recommended to use it in the preparation of monologues during extracurricular time
	Frantastique	Morocco	Online communication with artificial intelligence tools	Possibility of individual use to practice the speaking skill
Life situation modeling training	Frantastique	Morocco	Audio and video dialogues, for example, *Anna et Nadia parlent la r ception*	Recommended for practicing listening skills

Table 2, ending

Type of learning activity	Recommended educational digital resource	Country	Resource component	Commentary
	RESH	Russia	Practice exercises on various topics	Each lesson is based on the interests of the students, for example, 3rd grade – 'my family and friends', 10th grade – 'career choice'
	TV series Extra	Russia	Using series for thematic vocabulary instruction (e.g., going shopping, preparing dinner, etc.)	Capability to teach all language aspects through a single series
Teaching the history, culture and geography of France and French-speak-ing countries	Frantastique	Morocco	Educational video about Catherine Deneuve and Fran oise Dorleak based on the film *The Young Girls of Rochefort*	Introduction to French culture and listening comprehension practice through post-viewing tasks
	RESH	Russia	Interactive tasks to choose a quote from the national symbol of France	Recommended to use it when exploring the culture of different countries
	MESH	Russia	Videos about the sights of Canada	
Working in groups	Conjuguemos	Canada	A mini-game for conju-gation training	Possibility to play against each other and teams
	Google Classroom	Canada	Creating student groups on the platform	Use to assign tasks to the entire group and monitor their completion
Implementation of educational projects	Seesaw	Canada	Maintaining and using student portfolios	Project execution and regis-tration of results on the plat-form, it is possible to provide access to the teacher
	Google Classroom	Canada	Group creation and collaboration through the platform	Possibility of using in group project activities
	duNum	France	Letters duNum Lettres No. …	Possibility to find new materi-al for project activities
Spelling training	Corneille	France	A simulator for a phone/tablet, during which students need to repeat the spelling of a letter or syllable	Use in extracurricular activi-ties to practice spelling
	Teachapp	Morocco	Letter cards that tell you how to spell the alphabet correctly	Flashcards are used in les-sons to introduce students to the symbols of the alphabet
			Syllable and word writing simulator	Recommended for practicing lowercase letter writing

Source: compiled by Ekaterina S. Yakovleva.

Based on these recommendations, lesson plans have been developed that incorporate the use of information technologies identified through the study of approaches to teaching French in the aforementioned countries. These lesson plans can serve as prototypes for their further implementation in teaching Russian school students.

To experimentally verify the effectiveness of teaching French to school students using the proposed recommendations and developed lesson plans, a pedagogical experiment was conducted in a school setting.

The goal of the experiment was to substantiate the assumption that studying the experience and conducting a comparative analysis of the specifics of using IT in teaching French as both a native and foreign language in France, Canada, and Morocco, as well as comparing and incorporating the results of this analysis into improving the methodological system of French language instruction in Russia, contributes to enhancing the effectiveness of this training for students in Russian schools.

The pedagogical experiment was conducted at School No. 8 in Smolensk during the second quarter of the 2024/2025 academic year in ninth grades: 9A, 9B and 9C. It should be noted that in class 9C, there are two subgroups of students learning French. The total number of participants involved in the experiment is 73.

The classes were compiled into two groups: a control group and an experimental group. The control group was taught without the use of the recommended educational resources and developed lesson plans, while the experimental group was taught using the recommended information technologies and developed materials.

Table 3 presents the distribution of classes among the groups, as well as the number of individuals who participated in the experiment.

Table 3

The allocation of classes into groups in the framework of a pedagogical experiment

Classes and students / Group	Control Group		Experimental Group	
Classes	9A	9C (2)	9B	9C (1)
Number of Students	23	14	21	15
Total Students	37		36	

Source: compiled by Ekaterina S. Yakovleva.

These are the stages of the pedagogical experiment.

1. Conducting initial testing in the classes at the beginning of the second quarter.

2. Conducting lessons in the classes according to their distribution into control and experimental groups.

3. Conducting final testing at the end of the second quarter of instruction.

Each of the four sections in the administered testing was assessed on a scale from 0 to 25 points. Thus, the maximum possible score for the entire test was 100 points.

The test results for each student from the experimental group are presented in Figure 1, and for those from the control group – in Figure 2.

During the experimental work, statistical processing of the obtained data was carried out using the Pearson's chi-squared test, which is used to compare the distribution functions of objects from two populations based on the state of a certain property, utilizing measurements of this property in two independent samples drawn from the calculated populations.
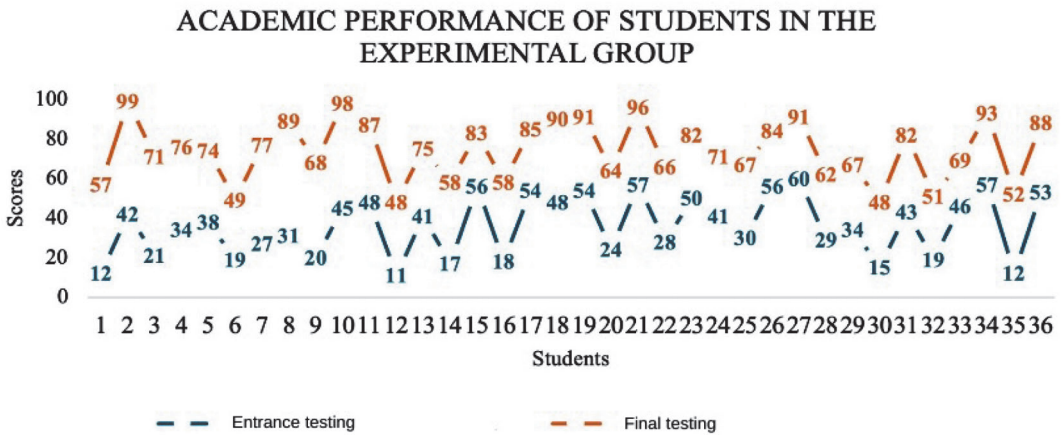
Figure 1. Academic performance of students in the experimental group
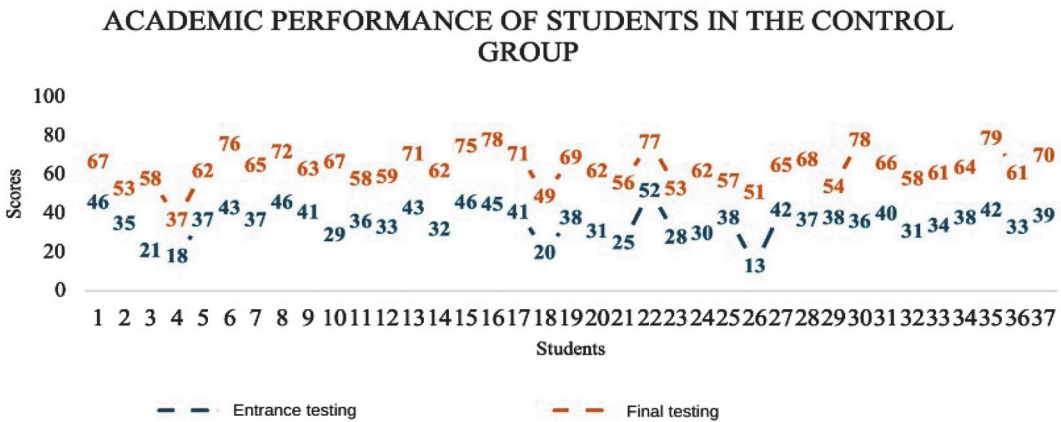*Source*: created by Ekaterina S. Yakovleva.

Figure 2. Academic performance of students in the control group
Source: created by Ekaterina S. Yakovleva.

The Pearson's correlation coefficient (r) is calculated using the following formula, where x and y are the sample means:

$$r = \frac{\sum (x - \overline{x})(y - \overline{y})}{\sqrt{\sum (x - \overline{x})^2 \sum (y - \overline{y})^2}}.$$

To facilitate the mathematical calculation using the formula, Microsoft Excel spreadsheet software was employed, with all obtained data entered into the program. The Pearson's chi-square test value for the control group was 0.78, while for the experimental group it was 0.86.

The comparative results diagram in Figure 3 displays the number of students in each group (N), the change in average score after initial and final testing, as well as the Pearson's coefficient for each group. The average test score in the control group increased from 35.5 to 63.6, while in the experimental group it rose from 35.8 to 74.1.
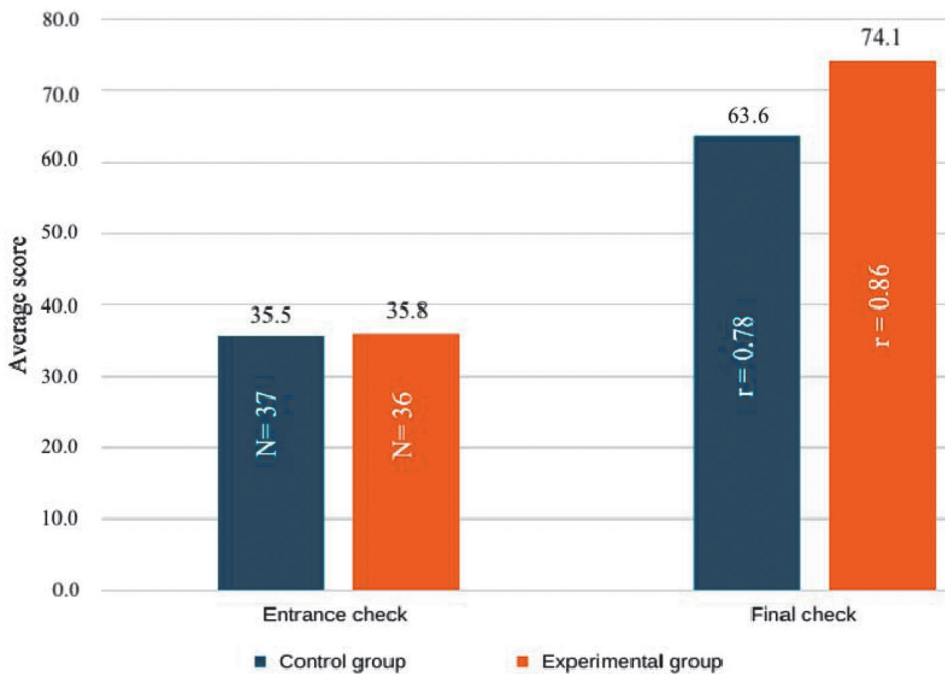
Figure 3. A comparative diagram based on the results of a pedagogical experiment
Source: created by Ekaterina S. Yakovleva.

Thus, the obtained experimental results demonstrate that the application of information technologies from the studied countries in French language lessons in schools contributes to enhancing the effectiveness of student preparation.

Conclusion. During the research, criteria and methods of comparative analysis of the possibilities and advantages of using information technology in teaching French in different countries are proposed. The purpose of such a comparative analysis is to identify the features of an educational electronic resource according to the proposed criteria for further development of recommendations on its use based on the data obtained.

More precisely, it can be stated that the study has yielded the following main findings and results.

1. Criteria and methods for the comparative analysis of the capabilities and advantages of using information technologies in teaching French across different countries have been proposed.

2. Based on a comprehensive analysis, the specific features of using information technologies in teaching French as both a native and foreign language in France, Canada, Morocco, and Russia have been identified, which are significant for consideration in improving methodological systems for teaching French to school students in Russian educational institutions.

3. Recommended information technology tools used in different countries have been selected and systematized according to the main types of learning activities characteristic of teaching French to school students.

4. Recommendations for teaching French in Russian schools have been developed, considering international experience in using information technologies.

5. It has been experimentally substantiated that incorporating the results of the conducted comparative analysis into improving the methodological teaching system contributes to enhancing the effectiveness of French language training for students in Russian schools.

6. Based on the consideration of international experience, recommendations have been developed for teaching French in Russian schools according to the following types of learning activities: grammar instruction, phonetics instruction, teaching speaking skills, instruction based on modeling real-life situations, teaching the history, culture and geography of France and Francophone countries, working in groups, implementation of educational projects and spelling training.

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