Abstract. Problem and goal. A priority aspect of learning Chinese as a foreign language is the use of electronic educational complexes and materials. However, in the context of the complex digitalization of society, special factors appear that should be taken into account when developing and implementing appropriate electronic educational tools. The purpose is to explore the features and potential of e-resources for teaching Chinese as a foreign language in secondary school. Methodology. Theoretical analysis and generalization of the literature are used to describe the conditions for effective teaching of the Chinese language, and the problems of improving the quality of students' educational results. The experiment involved 52 students from the Vyatka Humanitarian Gymnasium. Learning Chinese as a foreign language is supported by StudyChinese.ru, Chinese Boost, Shibushi.ru services. Fisher's criterion was used for statistical data processing. Results. In the experimental group, primary school students used e-resources for comprehensive informatization at all stages of learning Chinese as a foreign language (speaking, listening, reading, writing, intercultural communication and collaboration). An assessment of learning outcomes was made and statistically significant differences in the qualitative changes that occurred in the pedagogical system were revealed. The features of using e-resources for integrated informatization in the study of Chinese as a second foreign language in secondary school are described. Conclusion. The types of activities and interactive exercises in the information environment are formulated, which most effectively work to improve the quality of teaching Chinese as a second foreign language.

Keywords: linguodidactics, Chinese language, e-resource, complex informatization, quality of education

Article history: received 7 April 2022; revised 5 May 2022; accepted 20 May 2022.

Особенности использования электронных образовательных ресурсов при изучении китайского языка как второго иностранного в основной школе

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Аннотация. Проблема и цель. Приоритетным аспектом изучения китайского языка как иностранного является использование электронных учебных комплексов и материалов. Однако в условиях комплексной цифровизации общества появляются особые факторы, которые следует учитывать при разработке и внедрении соответствующих электронных средств учебного назначения. Цель – исследовать особенности и потенциал образовательных электронных ресурсов обучения китайскому языку как иностранному в основной школе.

Методология. Теоретический анализ и обобщение литературы использованы при описании условий эффективного обучения китайскому языку, проблем повышения качества образовательных результатов обучающихся. В эксперименте задействованы 52 ученика из Вятской гуманитарной гимназии. Изучение китайского языка как иностранного поддерживается сервисами StudyChinese.ru, Chinese Boost, Shibushi.ru. Для статистической обработки данных использован критерий Фишера.

Результаты. В экспериментальной группе учащиеся основной школы применяли образовательные электронные ресурсы для комплексной информатизации на всех этапах изучения китайского языка как иностранного (говорение, аудирование, чтение, письмо, межкультурная коммуникация и коллаборация). Произведена оценка результатов обучения и выявлены статистически достоверные различия в качественных изменениях, произошедших в педагогической системе. Описаны особенности использования электронных образовательных ресурсов для комплексной информатизации при изучении китайского языка как второго иностранного в основной школе.

Заключение. Сформулированы виды деятельности, типы интерактивных упражнений в информационной среде, максимально эффективно работающих на повышение качества обучения китайскому языку как второму иностранному.

Ключевые слова: лингводидактика, китайский язык, электронный образовательный ресурс, комплексная информатизация, качество обучения

История статьи: поступила в редакцию 7 апреля 2022 г.; доработана после рецензирования 5 мая 2022 г.; принята к публикации 20 мая 2022 г.


Problem and goal. The UNESCO recommendations, which define the rules and priorities in the field of international educational policy, define multiculturalism and multilingualism as important areas for the development of linguodidactics [1]. The study of a foreign language, including Chinese, should contribute to the assimilation of the features of traditions, general and national-specific in the way of life and cultural values of different people. Under the current sanctions and geo-
political tensions, relations between the Russian Federation and China are improving and developing in socio-economic and political areas. As a result, there is a growing interest in the Russian education system in improving the methods of teaching Chinese as a foreign language.

The Federal State Educational Standard (FSES) is a set of provisions that are mandatory for the implementation of the main training program. It establishes requirements for the results of its development: personal, meta-subject and subject. The study of a foreign language is essential to achieving demanded educational results [2]. It is one of the subjects of the philological cycle. It contributes to the formation of a communicative culture, speech development, broadening one's horizons, and educating a personality. O.A. Obdalova and O.V. Odegova emphasize that learning a foreign language helps students to get an idea of the world as a multilingual and multicultural community; understanding a language as the main means of communication between people [3]. In addition, the study of the Chinese language is preparation for the choice of a popular specialty, self-realization in the professional field [4] for many modern pupils.

T.L. Guruleva had proved that the process of teaching Chinese as a foreign language contains didactic opportunities for the formation of communicative competence; development of feelings of national identity and patriotism; the formation of the foundations of tolerance and multiculturalism of a holistic worldview [5]. At the same time, according to O.A. Maslovets, the study of Chinese as a foreign language has its features (reliance on visualization, writing order, structure, semantic and phonetic aspect of hieroglyphs) [6]. These features create certain difficulties for teaching methods.

In the context of the complex informatization of society, new resources appear that can improve the quality of teaching Chinese as a foreign language. For example, N.N. Serostanov and E.I. Choporova convincingly prove that a foreign language learning environment most effectively implements the above possibilities with the support of multimedia resources [2]. Yu.M. Shemchuk, M.D. Guseva, summarizing practical experience, conclude that Internet services for educational purposes are practically not created for the Chinese language [7]. The choice of a multimedia software complex remains with the language teacher.

Thus, the modern environment for teaching Chinese as a foreign language should be guided by the new realities of linguodidactics; provide opportunities for adaptation to specific conditions of the information educational environment; support the interconnected communicative and socio-cultural development of schoolchildren; encourage the participant of the linguodidactic process to be creative; use information technologies (multimedia, e-resources, software) at all stages of education. The last factor is especially important. Practice proves that the study of hieroglyphics using only paper sources seems uninteresting to students. There are also methodological difficulties: what kind of e-resources to use in the classroom; what means of informatization to offer students for independent work and self-development.

The analysis of the scientific works listed above allows us to identify the problem associated with the need to study the features and didactic potential of e-resources for the informatization of teaching Chinese as a foreign language.
in order to improve the quality of learning outcomes for students in basic schools. The article presents a study aimed at substantiating the use of modern e-resources in the study of Chinese as a second foreign language in elementary school.

**Methodology.** The study used the following methods: theoretical analysis and generalization of literature in describing the conditions for effective teaching of Chinese as a foreign language, identifying the problems in applying e-resources to improve the quality of education.

Various stages of information interaction include independent laboratory work, mini-research, creative projects, demonstration, work with traditional educational and methodological complexes, audio recordings, and copybooks.

Among empirical methods, we used: the monitoring of the communication of all participants in the interaction; analysis of answers, materials on work with electronic educational resources (virtual texts, quantity, and quality of handwriting worksheet, hieroglyphs); time estimation for finding the right solution and for studying theoretical material in publications; assessment of the volume and correspondence of the used hieroglyphs for visualization. These methods give up-to-date information about the quality of learning outcomes.

The introduction of e-resources for informatization of teaching Chinese as a foreign language to primary school students (selection of content, pictures, creation of resources) was conducted on the basis of the Vyatka Humanitarian Gymnasium. In total, 52 students from the fifth to ninth grades took part in the experiment. The average age of the respondents was 14 years (78% of girls and 22% of young people). Twenty test-type tasks diagnosed the quality of education. Below are examples of questions.

1. **Determine which statement is incorrect. Answer options:**
   a) Hunan Province is called “Hunan” because it is located south of Dongting Lake;
   b) Hunan Province is also the birthplace of Mao Zedong, the founder of the Republic of China;
   c) the statue of Mao Zedong was officially opened on December 26, 2009 in Jiujietou;
   d) Mao Zedong was elected chairman in 1945.

2. **Put the lines of Mao Zedong’s poem in the correct order.**
3. **From the proposed options, select the one that correctly reflects the information in the text:**
   a) the Gaoshan tribe is the main ethnic minority of Taiwan and settled in the province before the 17th century;
   b) in 1895, the Qing government ceded Taiwan and Penghu to Japan in the “Treaty of Nanjing;”
   c) Taiwan Province is a society dominated by the Gaoshan people;
   d) Taiwan Province was successively colonized by Japan and the United States.

4. **From the options provided, select the appropriate counter words:**
   1) 个; 2) 本; 3) 把; 4) 张; 5) 件.

5. **Determine the position in the presented text where you want to put the service particle.**
6. Choose suitable interrogative pronouns for the underlined words.
7. Select the appropriate Chinese time equivalent (four fifteen minutes, half-past nine, eleven seventeen minutes, ten forty-five minutes, eight fifty minutes).

The principles of selecting tasks for testing: interdisciplinary character, work with different parts of speech, numerals, communicative component, tolerance and patriotism, career guidance. The student could get from 0 to 100 points for the test. According to the results of measurements, the marks were determined as follows: from 0 (inclusive) to 55 points – “failed” and “passed” in all other cases. The Fisher criterion was applied to assess the effectiveness of the use of modern electronic educational resources in the secondary school in terms of improving the quality of teaching the Chinese language.

Results and discussion. The analysis of the literature was carried out in the following areas: identifying the psychological and pedagogical conditions for effective teaching of Chinese as a foreign language; didactic possibilities of using e-resources to improve the quality of education; existing experience in the use of informatization tools in the study of the Chinese language.

Summarizing the content of the provisions of the current Federal State Educational Standard, T.L. Guruleva concludes that it is the focus on achieving educational results that supports teachers in choosing didactic resources (textbooks, information technology, software, etc.), and not vice versa [5].

Within the framework of the first direction, it was determined that, on the one hand, the methodology of teaching Chinese as a foreign language is an integral system. It includes learning theories and basic principles of linguodidactics. On the other hand, as R. Calafato notes, it is a combination of various skills and abilities with the help of which these theories and principles are implemented in practice [8]. E.I. Passov argues that the traditional method of teaching Chinese as a foreign language is reduced to the formation of language competence. This makes it possible to provide graduates with a high level of linguistic training [9]. However, in the new pedagogical conditions, as M.U. Nadeem, R. Mohammed, S. Dalib justify, the formation of the ability and readiness for communicative speech activity should be at the forefront [10]. Teaching dialogic speech, according to E.V. Tikhonova, A.S. Potapova, A.V. Kreider [11], should be carried out in compliance with all the principles of communicative learning. At the reproductive stage, students can be asked to reproduce a sample dialogue, to perform exercises that prepare for the independent construction of dialogic communication. At the productive stage of forming the skills of dialogic speech, one should use personality-oriented technologies: offer to solve communicative tasks within the framework of educational and speech situations.

As part of the second direction of the analysis of the literature on the research problem, we note that, in the context of a dynamically developing information society, there is an increasing need to establish intercultural interaction with representatives of other countries [12]. In this context, S.S. Kuklina, E.N. Vladimirova indicate that graduates need to master not only communication skills but also various technical means and information resources [13]. O.A. Maslovets determines that e-resources must be integrated into the traditional process of learning the Chinese language [6]. For example, according to E.V. Tikhonova, A.S. Potapova, A.V. Kreider,
informatization tools will contribute to the activation of foreign language communication, intensification, individualization, and differentiation in education [11]. The task of the teacher is to optimally integrate them with traditional teaching materials, to support communication between all users of the resource [14]. A.A. Margolis and others believe that the use of game mechanics in teaching Chinese will create additional conditions for the development of the social activity, responsibility, and planning [15]. In her work, S.S. Kuklina studies the problems of creating a system of interactive exercises from the standpoint of a system-structural, personality-oriented activity, and communicative-cognitive approaches. Such a system is used in teaching listening as a means of oral foreign language communication and for students to achieve personal educational results.

When including e-resources in teaching Chinese as a foreign language, you must take into account some objective factors. The third line of analytical work with the literature was devoted to the identification of these factors. Yu.A. Azarenko determines the real need for education in the usage of modern technology and software tools for visualizing educational information in the study of Chinese as a foreign language [15].

T.E. Mashanlo notes that the mastery of hieroglyphs is a very subtle and complex process of activity that requires a conscious perception of memorization and thinking. The study of the aspect of writing, hieroglyphic writing with the help of information and communication technologies is one of the most difficult components of teaching the Chinese language [16]. According to R. Calafato, the study of Chinese as a foreign language with the support of e-learning courses should contribute to the formation of the main components of foreign language communicative competence [8]. In training, a variety of application of activity forms is necessary. T.L. Guruleva in her study concludes that the teacher is required to strive, be creatively focused on organizing, supporting the informational educational atmosphere that encourages schoolchildren to acquire new hieroglyphic knowledge in an e-resource environment [5]. Yu.A. Azarenko also comes to the conclusion that the content of many exercises, tasks, texts for reading, and illustrative material does not fully satisfy the principles of tolerance and multiculturalism, the development of social norms, rules of conduct [15]. The author notes that the existing e-resources do not always contain tasks that meet the requirements for the results of mastering the core curriculum (personal, meta-subject, subject).

So, combining traditional and innovative methods with the support of information technology is an appropriate and necessary condition for improving the quality of teaching Chinese as a foreign language. At the preparatory stage of the experiment, various digital services were considered (Coursera, LearnYu, eChineseLearning, Lingust, StudyChinese, Chinese Boost, Stepik, ShiBuShi, Memrise, Yoyo Chinese, Language Heroes, ChinesePod, etc.). The following criteria were taken into account in the analysis:

1. Support for the development of skills and abilities of foreign language communicative competence in accordance with the components: speech, language, sociocultural, compensatory, and educational and cognitive.
2. The level of user interaction with an e-resource to improve educational efficiency through the use of activity forms of learning (conditionally passive, active, activity, research forms).

3. Type of material presented (task book, laboratory workshop, textbook, study guide, lecture notes, test, control questions, electronic training course, etc.).

From the whole variety of multimedia teaching aids, the following services were selected according to the above criteria: StudyChinese.ru, Chinese Boost, Shibushi.ru.

StudyChinese.ru is the fastest-growing Chinese language site with online lessons, tests, exercises, dictionaries, grammar, phrasebooks, and articles. Examples of exercises: ask a question to the word given in brackets; make sentences from words; form negative sentences from affirmative sentences; print out a list of words, give them a translation, transcription for each word, and put down tones; connect the pinyin variant with the correct pronunciation of the syllable; read the syllables. The Chief Consultant is a specialist at Raystate Translations, Mr. Xie Wenkui. Among the functionality, we note the tools “Quick search by headings” and “Magic Pencil.” The theoretical material of the block contains information about the culture, habits and values of the Chinese, their daily life.

Chinese Boost is a Chinese language learning website with free resources and materials (Figure). The course contains Chinese grammar lessons for users of different language levels. All materials are free and open. Lots of exercises to convert Chinese characters. The theoretical material is presented in the form of rules. For example, “rely on emotional states.”
Pedagogy and Didactics in Informatization

Shibushi.ru is a multifunctional site with materials for learning Chinese, with simulators for learning individual words and phrases. The course includes exercises in theory and lessons in hieroglyphics and grammar. It is the presence of a variety of simulators, and online tools that the authors indicate as a distinctive feature of the resource.

To assess the input conditions, a control work of 20 tasks was carried out, compiled according to the previously described principles. Thus, it was possible to collect data on 52 students, from which the experimental and control groups were formed.

The second stage of the experiment is the use of the chosen means of informatization in teaching Chinese as a foreign language in elementary school. The participants of the experimental group received new theoretical material, tasks, exercises, and research project topics in the process of working with the e-resources.

During the work, the following types of interactive exercises were performed:

1. Answer the questions in Chinese (it was proposed to provide options in expanded form). For example, why do you like pets?
2. Translate the phrase into Chinese using the new words. For example, “this puppy is a wonderful gift for children.”

In the dialogues, situations of communication at the doctor's, at a party, on a trip, etc., were modeled.

Students in the control group studied topics according to the work program of the discipline in the traditional way through a cycle of classes on the teaching materials of M.B. Rukodelnikova, O.A. Salazanova, L.S. Kholkina.

After the use of multimedia teaching aids, another test was carried out according to the principles indicated earlier. The validity of the experimental results was verified using the Fisher criterion. The control measurement data before and after the experiment are presented in Table.

### The results of control datameasurements

<table>
<thead>
<tr>
<th>Proportion of students</th>
<th>Before the experiment</th>
<th>After the experiment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control group</td>
<td>Experimental group</td>
</tr>
<tr>
<td>With the mark “not credited”</td>
<td>76,9% (20)</td>
<td>80,8% (21)</td>
</tr>
<tr>
<td>With the mark “credited”</td>
<td>23,1% (6)</td>
<td>19,2% (5)</td>
</tr>
</tbody>
</table>

Calculations were made using an online calculator (https://www.psychokok.ru/statistics/fisher/). The critical value of the Fisher criterion for a significance level of 0.05 ($\phi_{\text{crit}}$) is 1.64. The following hypotheses were accepted: $H_0$ – the level of educational results in the experimental group is statistically equal to the level of the control group; $H_1$ – the level of learning outcomes of schoolchildren in the experimental group is higher than the level of the control group. The empirical value of the Fisher criterion before the start of the experiment is $0.346$ ($\phi_{\text{emp}} = 0.346 < \phi_{\text{crit}} = 1.64$). Therefore, before the start of the experiment, the hypothesis $H_0$ is accepted. The value of the Fisher criterion after the experi-
ment is 2.567 (φ_{crit} = 1.64 < φ_{emp} = 2.567), so the hypothesis H₀ is rejected and H₁ is accepted.

After learning Chinese as a second foreign language educational results improved: the proportion of students with a “pass” mark increased by 42% in the experimental group. In the control group, the increase was only 4%. When discussing the didactic potential of multimedia tools, it was found that improvement in educational results happened because:

1) the study of e-recourses materials contributes to immersion in the history of the country and sports, the formation of multiculturalism and multilingualism;

2) manipulation with images, audio and video materials contributes to the formation of demanded information competencies;

3) when studying a new theory, pronunciation and writing complex hieroglyphs, students develop moral, moral-volitional qualities, etc.;

4) a problematic approach to the study of the Chinese language is being implemented.

**Conclusion.** Thus, the following features of the use of e-recourses in teaching Chinese as a foreign language in secondary school were identified:

1. The study of the rules of pronunciation and the production of sounds should be preceded by an introductory phonetic course.

2. After staging a new sound, it is advisable to use a multimedia tool to carry out the primary consolidation of the skill in syllabic exercises. At the initial stage of training, the key priority is the phonetic development of Chinese lexical units, which work with transcription systems of Chinese characters.

3. It is necessary to use visual aids (images, diagrams, puzzles) at the stage of mastering the written language of the Chinese language.

4. In Chinese, one of the most important components of the correct translation, and, consequently, the correct understanding of the text, is the knowledge of grammar. In the e-recourses environment, special attention should be paid to the spelling of hieroglyphs and the study of graphemes.

5. Maintain the cognitive and communicative nature of the interaction. Priority should be given to exercises and tasks of a cognitive nature, the study of linguistic phenomena.

6. Initiate students’ speech activity when using tasks of the following types: answers to problematic issues; formulation and argumentation of opinions; development of an idea, situation.

7. Teaching dialogic speech in an e-recourses environment should be carried out in compliance with all the principles of communicative learning.

To improve the proposed approach to informatization of learning Chinese as a second foreign language in secondary school, we propose the following directions: include more tasks for working with hieroglyphs; add to the cards for memorizing new words a tool for listening to them. The results obtained expand and supplement the conclusions of T.L. Guruleva [5] about the potential of information educational tools for teaching Chinese as a foreign language. In addition, it was possible to confirm the position of T.E. Mashanlo regarding the impact of learning the Chinese language on the development of multiculturalism and multilingualism [16].
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