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Digital literacy and Web 3.0: innovative approaches to teaching foreign languages to students at universities

D.B. Ayasheva*¹, S.S. Nurkenova²

^{1,2} L.N. Gumilyov Eurasian National University, Astana, Kazakhstan

(E-mail: ¹diana.ayasheva.kz@gmail.com, ²nurkenova_s@mail.ru)

Abstract. The article is devoted to the study of the issue of digital literacy and the use of Web 3.0 technologies in teaching foreign languages to students at universities. The results of a review of the study of the introduction of new generation digital tools and technologies, which, according to the authors, contribute to improving language skills and help students learn foreign languages in the modern digital world, are presented. The article also discusses the theoretical foundations of digital literacy and the introduction of Web 3.0 technologies in the process of teaching foreign languages, provides examples and recommendations. Particular attention is paid to justifying the effectiveness of the proposed approaches and their structured implementation in the educational process.

The article contains the results of the analysis of the opinions of teachers and students of L.N. Gumilyov Eurasian National University on the use of innovative technologies in the process of teaching foreign languages. As a result of conversations with study participants, both positive aspects of the introduction of Web 3.0 technologies and key challenges faced by participants in the educational process were identified. The faculty note increased student engagement through interactive platforms and online projects, but face technical difficulties and the need for ongoing professional development. The students, in turn, emphasize the significance of access to high-quality Internet and the importance of balanced use of traditional teaching methods and digital technologies. The main focus of the article is on the pedagogical aspects of the introduction of Web 3.0 technologies, including methodological developments aimed at increasing the motivation of students and developing their critical thinking in general and increasing digital literacy in particular.

Key words: digital literacy; Web 3.0 technologies; foreign language learning; adaptive learning systems; pedagogical approaches; interactive platforms.

Introduction

In recent decades, digital literacy has become one of the key competencies necessary, according to researchers, for successful functioning in modern society. Due to the very intensive

development of information technologies and the evolution of the Internet space to the level of Web 3.0, educational institutions have faced the task of integrating innovative digital solutions into the learning process. In this context, special attention is paid to the study of foreign languages, which is an integral part of the training of specialists capable of working in a global economy.

According to researchers, traditional methods of teaching foreign languages are often found not effective enough in the face of rapidly changing digital realities. Web 3.0, which uses artificial intelligence, blockchain technologies and a semantic network, offers new opportunities for personalizing and adapting educational processes to the individual needs of all students. The integration of these technologies into teaching foreign languages allows students to increase their motivation, develop their digital literacy and offer more flexible and innovative approaches to studying the material.

The relevance of the study is due to the need to develop students' skills that go beyond standard language competencies and include the ability to effectively use digital tools for interaction in a foreign language. It should be noted that in a world where rapid digitalization and globalization are taking place, these skills are becoming critical for both personal and professional growth of students.

The purpose of the article is to consider innovative approaches to teaching foreign languages to students through the prism of digital literacy and the possibilities of using Web 3.0.

Literature review

The issue of digital literacy and its role in teaching foreign languages has a long history. Back in the early 2000s, researchers began to pay attention to the importance of developing students and teachers' skills in working with information and communication technologies. With the introduction of Web 2.0, the focus has shifted to interactive online tools and digital literacy as a necessary component of the educational environment. For example, studies by K. Maslach and M.P. Leiter revealed the relationship between the teacher burnout and the level of their digital training, which is crucial in the context of modern educational challenges (Maslach and Leiter, 1999).

In the domestic context, a strategic contribution is the UNESCO project on media literacy, aimed at preparing teachers for the effective use of digital technologies in educational practice (UNESCO, 2021a). Within the framework of this project, special attention is paid to information literacy and methods for its development among teachers.

The use of Web 3.0 technologies in foreign language learning has been actively discussed in recent years. For example, the works of F. Huang, J. Qi, A. Xie, showed that after a period of distance learning caused by the pandemic, English teachers in China began to implement more complex digital solutions, which changed their approach to learning and interacting with students (Huang and Xie, 2022). These results can be useful for the development of new techniques in Kazakhstan, where there is also interest in using advanced technologies in the education system.

In the Republic of Kazakhstan, organizations such as KazTEA and KazAELT have been actively working for a long time to integrate digital technologies into educational programs. KazTEA webinars on the application of Web 2.0 and Web 3.0 highlight the importance of cognitive development of students using technology to teach languages. In particular, it is determined

that the introduction of digital literacy contributes to the development of critical thinking and a deeper understanding of linguistic structures (Kazakhstanskaya assotsiatsiya prepodavateley angliyskogo yazyka, n.d.). KazAELT research can be used to describe the importance of digital tools in teaching foreign languages. For example, as noted at the KazAELT webinars, the use of interactive applications or blogs in educational projects creates conditions for the active participation of students and the integration of language practice into a real digital environment (Assotsiatsiya povysheniya kvalifikatsii uchiteley angliyskogo yazyka v Kazakhstane, n.d.).

It is also necessary to note the UNESCO initiative on media literacy in Kazakhstan, aimed at improving the skills of teachers in using ICT in the educational process (UNESCO, 2021b).

As for foreign researchers, it can be noted that many of them, including B. Y. Ntelioglou, J. Fannin, D. Montemurro, J. Cummins, demonstrated in their studies that the use of multimodal tools such as iMovie and iPhoto allow students to develop writing and cognitive skills while creating conditions for self-expression. This is especially important in Web 3.0, where content creation becomes an integral part of the learning process (Ntelioglou and others, 2014). The results of research by these authors clearly demonstrate that digital tools not only help in language learning, but also allow one to penetrate deeper into cultural and social aspects.

Research by J. C. Yang, H. C. Yeh on the application of YouTube in teaching sociocultural aspects of English shows that multimedia platforms help students better understand cultural differences and contexts, which is vital for shaping intercultural communication in a globalized world. Their results suggest that this circumstance is a significant attribute for the integration of international experience in the process of practical use of Web 3.0 to expand the language skills of students (Yang and Yeh, 2021).

Thus, the integration of research results from domestic and foreign sources makes it possible to create a multi-level learning model in which Web 3.0 technologies play a key role in the development of language and cognitive skills of university students. Based on the Kazakh experience, it is possible to show how digital literacy affects the training of students, and international studies add context for the use of multimodal and multimedia tools to strengthen intercultural communication and critical thinking.

Methods

To achieve the goal of this study, we decided to use a combined study method. Analysis of domestic and foreign literature, conducting conversations with experienced teachers and students will reveal the features of innovative approaches (digital literacy and Web 3.0) to teaching foreign languages to students at higher education.

Results and Discussion

Digital literacy is a collection of skills and competencies necessary for the effective use of digital technologies in various areas of life, including education. In the modern education system, in the context of foreign language learning, digital literacy includes the ability to use digital tools to improve language skills, access information resources and interact with native speakers through digital platforms.

Web 3.0, also known as "Semantic Web," is characterized by the integration of artificial intelligence, machine learning and extended interactivity, which allows participants in the

educational process to create more personalized and adaptive educational environments. In the process of teaching foreign languages, Web 3.0 provides opportunities for the creation of intelligent learning systems, virtual classrooms and interactive platforms that contribute to a deeper and more effective assimilation of the material.

The integration of Web 3.0 into the process of teaching foreign languages is based on modern pedagogical approaches, such as constructivism, collaborative learning and project-oriented learning. These approaches contribute to the active participation of students in the educational process, the development of critical thinking and the application of language skills in real situations.

As studies by B. Y. Ntelioglou, J. Fannin, D. Montemurro, J. Cummins have shown, the use of multimedia tools such as iMovie allows students to create their own video projects, which contributes to the development of written and oral skills, as well as an improved understanding of the cultural contexts of the language. In the case of Kazakhstan, such tools can be integrated into the curriculum, inviting students to create videos in the language studied, which are then published on the YouTube platform to receive feedback from teachers and peers.

The study by M. A. Yusukhno demonstrates how joint blogging and podcasting contributes to the development of communication and cultural competencies of students. So, teachers can organize course projects in which students create and maintain their own blogs or podcasts, discussing various topics in a foreign language. This, as noted by M. A. Yusukhno, not only improves language skills, but also promotes intercultural exchange and understanding (Yusukhno, 2021).

Researcher T. Velisova points out that the use of wiki platforms for co-writing texts improves the editing and correction process, as well as contributes to the development of self-correction skills and interaction with other students. Such platforms can be used by the teaching staff of universities in Kazakhstan to conduct group projects, where students jointly create educational materials or research using Web 3.0 tools for exchanging ideas and feedback (Velichova, 2014).

KazTEA and KazAELT conduct regular webinars and online courses aimed at improving the digital literacy of foreign language teachers. These activities include training on the use of Web 3.0 tools, exchange of experience and guidelines. Introduction of such programs in educational institutions of Kazakhstan contributes to the professional development of teachers and improving the quality of student education.

Thus, summing up the above, we can highlight the following recommendations for teachers:

- integration of digital tools into the educational process;
- development of digital competence;
- encouraging creativity and independence of students.

That is, it means that educators must actively use multimedia and collaborative tools such as video editors, blogs, wiki platforms and social media to create interactive and engaging lessons. Regular participation in professional webinars and courses organized by KazTEA and KazAELT will help teachers master new technologies and teaching methods. Enabling students to create their own projects and content fosters their creative and critical skills.

Based on these recommendations, we can also highlight recommendations for the management of universities:

- create an infrastructure for digital learning
- organize professional development

- develop digital training materials
- stimulate research activities.

Therefore, universities should ensure the availability of high-speed Internet, the availability of modern devices and software for all students and teachers as well as providing teachers with training programs on the use of Web 3.0 technologies and digital tools in the educational process. Plus, training materials have to be based on Web 3.0 capabilities, including interactive tasks, virtual labs, and multimedia assets. Ultimately, academic management ought to advocate scientific research and projects aimed at studying the effectiveness of the use of digital technologies in teaching foreign languages.

Thus, we can suggest the following tasks that meet the theme of our research.

Example 1. Making a foreign language video. Students create a short video in the language they are learning, reflecting their understanding of a particular topic (such as describing their city, cultural traditions, or self-interest). Videos are shared on YouTube, where the teacher and other students provide their feedback. Such a project promotes multimedia skills, improves the ability to express thoughts in a foreign language and stimulates intercultural communication.

Example 2. Collaborative blog writing. Students maintain a collective blog, publishing articles on various topics. Each student is responsible for writing and editing specific pieces of content, as well as providing feedback to their colleagues. Writing a blog together develops skills in self-correction, critical thinking, and effective team interaction.

Example 3. Virtual Museum. Students create a virtual exhibit using Web 3.0 tools such as virtual tours and multimedia presentations. Displays include descriptions of artifacts, cultural traditions and historical events in the language studied. The creation of a virtual museum contributes to the development of research skills, deepening cultural knowledge and improving language competencies.

As a part of our research, we conducted a series of interviews with experienced teachers and students at the L.N. Gumilyov Eurasian National University in order to study their experience in using Web 3.0 technologies and digital literacy in the process of teaching foreign languages.

Before the interview began, a detailed scenario was developed, including questions regarding pedagogical approaches to the use of technology, as well as the challenges faced by teachers and students in connection with the implementation of Web 3.0. The main issues addressed aspects of the use of digital tools in classroom and independent work, their impact on student motivation, as well as the role of teachers in the digital age.

We will reveal the results of the interviews with teachers.

Teachers noted that the use of Web 3.0 tools, such as virtual classes and online courses, helps students become more involved in the learning process. For example, interactive assignments on platforms where students can work on projects in real time stimulate critical thinking and contribute to a deeper understanding of the material.

One of the main challenges facing educators is the need for ongoing training and upskilling to work with new tools. The rapid development of digital technologies requires not only time to learn them, but also the adaptation of educational materials, which is often not provided for in curricula. Teachers also face technical problems - for example, the low availability of high-speed Internet in some regions makes it difficult to conduct online classes.

Most of the faculty surveyed expressed concern that not all students have access to the necessary technologies, such as modern devices or high-speed Internet, especially outside

of educational institutions. This creates an imbalance in the ability of students to complete assignments and participate in online activities.

Some teachers shared their experience of using adaptive learning systems that, using artificial intelligence and machine learning, adapt the educational process to the individual needs of students. This approach allows you to effectively work with groups where the level of language proficiency varies.

Let us reveal the results of the interview with students.

Students noted that the use of technology, such as interactive presentations, online quizzes and video tutorials, makes the learning process more fun. They also value the opportunity to participate in international online courses and workshops, allowing them to develop both language and digital competencies.

Like educators, students face challenges in accessing necessary technical facilities, especially in rural areas. Some of them have difficulty accessing platforms to complete tasks, which can negatively affect their academic performance.

Despite the positive attitude towards technology, many students expressed the opinion that technology should not completely replace traditional teaching methods. They note that the combination of digital and classical approaches creates more effective conditions for learning language skills.

Based on the results of the conversations, a table was compiled containing the results of a comparative analysis of the opinions of teachers and students on the use of Web 3.0 technologies in teaching foreign languages (Table 1).

Table 1. Comparative analysis of opinions of teachers and students on the use of Web 3.0 technologies in teaching foreign languages

Key aspects	Teachers	Students
Use of technology	Web 3.0 (interactive platforms, virtual classrooms) increases students' activity	Technology makes learning more interesting and dynamic (video tutorials, online quizzes)
Technical issues	Unstable Internet and lack of equipment complicate the use of technology in training	Problems with access to the Internet and devices outside the educational process
Professional development and adaptation	Teachers must constantly improve their qualifications for the effective implementation of digital technologies	There is no emphasis on learning, but it is important to support teachers in adapting to new technologies
Equal opportunities	Unrest over unequal access to technology in students, which creates an imbalance in learning	Limited access to resources, especially in rural regions, makes it difficult to participate in the learning process.
Traditional teaching methods	Digital technologies should complement, not replace, traditional methods	Support balanced use of technology and traditional approaches in training
Innovative approaches	Using adaptive learning systems to personalize the educational process	They support digital innovation, but want to preserve classic methods for in-depth study

Note: compiled by the authors based on the results of the interviews

The analysis of the opinions of teachers and students presented in Table 1 shows that both groups are positive about the use of Web 3.0 technologies in the educational process, noting their potential to intensify training and personalize educational approaches. However, there are significant challenges, such as technical challenges, inequities in access to resources, and the need for ongoing training for educators. Students and faculty agree that technology should complement, not replace, traditional teaching methods, creating a balance between new and classical approaches.

Thus, the results of the conversations show that teachers and students see great prospects in using Web 3.0 technologies in the educational process, but they face a number of challenges. The main ones are related to technical problems and the need for constant professional development of teachers. It is considerable to note that Web 3.0 technologies play a significant role in increasing student motivation and engagement, especially through interactive and multimedia tasks. However, to successfully integrate innovation into the educational process, systematic efforts are needed to create a level playing field of access to technology and support the professional growth of teachers.

Consequently, innovative Web 3.0 technologies integrated into the learning process open up new opportunities for development, both teachers and students, but require significant efforts to effectively implement them. To successfully apply Web 3.0 in teaching foreign languages, it is necessary to take into account both positive aspects and challenges that arise in the educational environment. Faculty and students agree that technology should be a supportive tool to foster both language and digital skills, but not a substitute for traditional teaching methods. A key aspect is the creation of equal conditions for access to educational resources and training teachers in modern technologies, which will make it possible to successfully integrate innovations into the daily educational process.

Conclusion

Web 3.0 technologies, the role of teachers and students is changing significantly. Web 3.0 technologies provide new opportunities for personalized learning, active interaction, and dynamic learning environments. Teachers, like researchers, see these technologies as an opportunity to increase students' engagement and optimize the educational process, but they face the need for constant professional development and technical limitations.

The integration of Web 3.0 technologies into the process of teaching foreign languages has, according to researchers, high efficiency in the development of both language and cognitive skills of students. Multimedia tools contribute to a deeper understanding of the material, increasing students' motivation and engagement. Numerous studies conducted both in Kazakhstan and abroad confirm the positive impact of digital technologies on the quality of training and professional development of teachers.

Future foreign language learning in Web 3.0 is associated with the further development of artificial intelligence, virtual and augmented reality, which will create even more interactive and adaptive educational environments. Therefore, it is essential to continue investing in infrastructure, professional development of teachers and the development of innovative teaching materials to maintain a high level of digital literacy and quality of language education.

Despite the obvious advantages, the introduction of Web 3.0 technologies faces a number of challenges, such as a lack of technical infrastructure, limited resources for professional

development of teachers and the need to adapt curricula. To overcome these challenges, it is recommended to:

1. Invest in digital infrastructure and educational technology at the national level.
2. Collaborate with technology providers to provide access to modern tools and resources.
3. Create platforms to share experiences and best practices among educators.
4. Include modules on digital literacy and the use of Web 3.0 tools in curricula.

Thus, Web 3.0 technologies and the development of digital literacy open up new horizons in learning, but require a systematic approach aimed at overcoming technical and organizational difficulties in order to ensure the full development of student competencies.

Contribution of the authors

D.B. Ayasheva – literature review, research methodology development, data collection and analysis, manuscript drafting.

S.S. Nurkenova – research concept formulation, academic supervision, methodological guidance, manuscript revision and approval.

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Д.Б. Аяшева*¹, С.С. Нүркенова²

^{1,2}Л.Н. Гумилев атындағы Еуразия ұлттық университеті, Астана, Қазақстан

Цифрлық сауаттылық және Web 3.0: университеттердегі студенттерге шет тілдерін оқытудағы инновациялық тәсілдер

Аннотация. Мақала цифрлық сауаттылық мәселесін зерттеуге және университет студенттеріне шет тілдерін оқытуда Web 3.0 технологияларын пайдалануға арналған. Жаңа буынның цифрлық құралдары мен технологияларын енгізу мәселесін зерделеуді шолудың нәтижелері ұсынылды, авторлардың айтуынша, олар тілдік дағдыларды жақсартуға және студенттерге қазіргі заманғы цифрлық әлем жағдайында шет тілдерін меңгеруге көмектеседі. Сондай-ақ мақалада цифрлық сауаттылықтың теориялық негіздері және шет тілдерін оқыту процесіне Web 3.0 технологияларын енгізу қарастырылады, мысалдар мен ұсынымдар келтіріледі. Ұсынылған тәсілдердің тиімділігін негіздеуге және оларды білім беру процесіне құрылымдық енгізуге ерекше назар аударылады.

Мақалада Л.Н. Гумилев атындағы Еуразия ұлттық университетінің оқытушылары мен студенттерінің шет тілдерін оқыту процесінде инновациялық технологияларды қолдану туралы пікірлеріне жүргізілген талдау нәтижелері қамтылған. Зерттеуге қатысушылармен әңгімелесу нәтижесінде Web 3.0 технологияларын енгізудің оң аспектілері де, білім беру процесіне қатысушылар тап болатын негізгі сын-қатерлер де анықталды. Оқытушылар интерактивті платформалар мен онлайн-жобалардың арқасында студенттердің тартымдылығын арттыруды атап өтеді, бірақ техникалық қиындықтармен және біліктілікті үнемі арттыру қажеттілігімен бетпе-бет келеді. Студенттер өз кезегінде сапалы интернетке қолжетімділіктің маңыздылығын және дәстүрлі оқыту әдістері мен цифрлық технологияларды теңгерімді пайдаланудың маңыздылығын атап өтеді. Мақаланың мәтінінде негізгі назар студенттердің жалпы уәждемесін күшейтуге және олардың сын тұрғысынан ойлауын дамытуға, атап айтқанда цифрлық сауаттылығын арттыруға бағытталған әдістемелік әзірлемелерді қоса алғанда, Web 3.0 технологияларын енгізудің педагогикалық аспектілеріне аударылады.

Негізгі сөздер: цифрлық сауаттылық; Web 3.0 технологиялары; шет тілдерін оқыту; оқытудың бейімделген жүйелері; педагогикалық тәсілдер; интерактивті платформалар

Д.Б. Аяшева*¹, С.С. Нүркенова²

^{1,2}Евразийский национальный университет имени Л.Н. Гумилева, Астана, Казахстан

Цифровая грамотность и Web 3.0: инновационные подходы к обучению иностранным языкам студентов в ВУЗе

Аннотация. Статья посвящена исследованию вопроса цифровой грамотности и использования технологий Web 3.0 в обучении иностранным языкам студентов ВУЗа. Представлены результаты

обзора изучения вопроса внедрения цифровых инструментов и технологий нового поколения, которые, по утверждению авторов, способствуют улучшению языковых навыков и помогают студентам осваивать иностранные языки в условиях современного цифрового мира. Также, в статье рассматриваются теоретические основы цифровой грамотности и внедрения технологий Web 3.0 в процесс обучения иностранным языкам, приводятся примеры и рекомендации. Особое внимание уделяется обоснованию эффективности предложенных подходов и их структурированному внедрению в образовательный процесс.

Статья содержит результаты проведенного анализа мнений преподавателей и студентов Евразийского национального университета имени Л.Н. Гумилева о применении инновационных технологий в процесс обучения иностранным языкам. В результате бесед с участниками исследования выявлены как положительные аспекты внедрения технологий Web 3.0, так и ключевые вызовы, с которыми сталкиваются участники образовательного процесса. Преподаватели отмечают повышение вовлеченности студентов благодаря интерактивным платформам и онлайн-проектам, но сталкиваются с техническими трудностями и необходимостью постоянного повышения квалификации. Студенты, в свою очередь, подчеркивают важность доступа к качественному интернету и важность сбалансированного использования традиционных методов обучения и цифровых технологий. Основное внимание в тексте статьи уделяется педагогическим аспектам внедрения технологий Web 3.0, включая методические разработки, направленные на усиление мотивации студентов и развитие их критического мышления, в общем, и повышения цифровой грамотности, в частности.

Ключевые слова: цифровая грамотность; технологии Web 3.0; обучение иностранным языкам; адаптивные системы обучения; педагогические подходы; интерактивные платформы

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Авторлар туралы мәліметтер:

Аяшева Диана Батырбекқызы – хат-хабар авторы, Л.Н.Гумилев атындағы Еуразия ұлттық университетінің докторанты, Қажымукан көш. 11, 010000, Астана, Қазақстан.

Нұркенова Сәуле Слямбекқызы – филология ғылымдарының кандидаты, Л.Н. Гумилев атындағы Еуразия ұлттық университетінің шетел филологиясы кафедрасының доценті, аға оқытушысы, Қажымукан көш. 11, 010000, Астана, Қазақстан.

Сведения об авторах:

Аяшева Диана Батырбековна – автор для корреспонденции, докторант ЕНУ имени Л.Н.Гумилева, ул. Кажымукана, 11, 010000, Астана, Казахстан.

Нуркенова Сауле Слямбековна – кандидат филологических наук, доцент кафедры иностранной филологии ЕНУ имени Л.Н. Гумилева, ул. Кажымукана, 11, 010000, Астана, Казахстан.

Information about the authors:

Ayasheva Diana Batyrbekovna – corresponding author, doctoral student at L.N. Gumilyov ENU, Str. Kazhymukan 11, 010000, Astana, Kazakhstan.

Nurkenova Saule Slyambekovna – Candidate of Philology, Associate professor at the Department of Foreign Philology of L.N. Gumilyov ENU, Str. Kazhymukan 11, 010000, Astana, Kazakhstan.