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ENHANCING FOREIGN LANGUAGE LEARNING IN HIGHER EDUCATION THROUGH WEB 2.0 AND WEB 3.0 TECHNOLOGIES: A CASE STUDY AT L.N. GUMILYOV EURASIAN NATIONAL UNIVERSITY

The rapid advancement of information and communication technologies has led to the emergence of innovative educational tools, significantly impacting foreign language learning. This study explores the effectiveness of Web 2.0 and Web 3.0 technologies in enhancing language acquisition at L.N. Gumilyov Eurasian National University over a four-month period. University students participated in interactive sessions using a variety of digital tools, including blogs, wikis, social media platforms, and semantic web technologies, which facilitated both direct and personal interaction. Quantitative data were gathered through a comprehensive 37-item questionnaire and detailed blog reflections, providing insights into students' experiences, interaction dynamics, and feedback on the technological tools used. The findings reveal that Web 2.0 and Web 3.0 tools, with their ability to support semantic networks, significantly enrich the learning experience compared to traditional methods, leading to improved language skills. The study underscores the necessity for continuous pedagogical adaptation to effectively incorporate these technologies, thereby promoting principles of lifelong learning. 100 students of the L.N. Gumilyov Eurasian National University took part in the survey.The practical significance of this research lies in its potential to inform educational strategies, fostering a more interactive and personalized learning environment. Future investigations can be devoted to adaptive network communities to further refine and enhance educational practices in the digital age.

Keywords: Web 2.0, Web 3.0, foreign language learning, educational technology, network communities, higher education, semantic web, interactive learning.

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WEB 2.0 және WEB 3.0 технологиялары арқылы жоғары білімде шет тілдерін үйренуді жақсарту: Л.Н. Гумилёв атындағы Еуразия ұлттық университетіндегі жағдайлық зерттеу

Ақпараттық және коммуникациялық технологиялардың қарқынды дамуы инновациялық білім беру құралдарының пайда болуына алып келді, бұл шет тілін үйренуге елеулі әсер етеді. Бұл зерттеу Л.Н. Гумилев атындағы Еуразия ұлттық университетінде Web 2.0 және Web 3.0 технологияларының тілдік дағдыларды жетілдіру тиімділігін төрт ай бойы зерттейді. Университет студенттері блогтар, уикилер, әлеуметтік медиа платформалар және семантикалық веб-технологияларды қоса алғанда, әртүрлі сандық құралдарды пайдалана отырып, интерактивті сессияларға қатысты, бұл тікелей және жеке өзара әрекеттесуді жеңілдетті. Сандық мәліметтер 37 элементтен тұратын сауалнама және блогтағы толық рефлексиялар арқылы жиналып, студенттердің тәжірибесі, өзара әрекеттесу динамикасы және қолданылған технологиялық құралдар туралы кері байланыс туралы түсінік берді. Зерттеу нәтижелері Web 2.0 және Web 3.0 құралдарының семантикалық желілерді қолдау мүмкіндігі бар болғандықтан, дәстүрлі әдістермен салыстырғанда оқыту тәжірибесін едәуір байытады, бұл тілдік дағдылардың жақсаруына әкеледі. Зерттеу бұл технологияларды тиімді енгізу үшін үздіксіз педагогикалық бейімделудің қажеттілігін көрсетеді, осылайша өмір бойы оқыту қағидаттарын насихаттайды. Сауалнамаға Л.Н.Гумилев атындағы ЕҰУ-дің 100 студенті қатысты. Бұл зерттеудің практикалық маңыздылығы интерактивті және жекелендірілген оқу ортасын қалыптастыратын білім беру стратегияларын ақпараттандыру әлеуетінде жатыр. Болашақ зерттеулер білім беру тәжірибелерін одан әрі жетілдіру және жақсарту үшін бейімделгіш желілік қауымдастықтарға арналуы мүмкін.

Түйін сөздер: Web 2.0, Web 3.0, шет тілін үйрену, білім беру технологиялары, желілік қауымдастықтар, жоғары білім, семантикалық веб, интерактивті оқыту.

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Повышение эффективности изучения иностранных языков в высшем образовании с помощью технологий WEB 2.0 И WEB 3.0: Кейс-стади Евразийского национального университета им. Л.Н. Гумилёва

Быстрое развитие информационных и коммуникационных технологий привело к появлению инновационных образовательных инструментов, которые значительно влияют на изучение иностранных языков. Это исследование изучает эффективность технологий Web 2.0 и Web 3.0 в улучшении языковых навыков в Евразийском национальном университете им. Л.Н. Гумилева в течение четырех месяцев. Студенты университета участвовали в интерактивных сессиях, используя различные цифровые инструменты, включая блоги, вики, социальные медиа платформы и семантические веб-технологии, что способствовало прямому и личному взаимодействию. Количественные данные были собраны с помощью комплексной анкеты из 37 пунктов и подробных блог-рефлексий, предоставляющих информацию об опыте студентов, динамике взаимодействия и отзывах об используемых технологических инструментах. Результаты показывают, что инструменты Web 2.0 и Web 3.0, благодаря своей способности поддерживать семантические сети, значительно обогащают учебный процесс по сравнению с традиционными методами, приводя к улучшению языковых навыков. Исследование подчеркивает необходимость постоянной педагогической адаптации для эффективного внедрения этих технологий, тем самым способствуя принципам обучения на протяжении всей жизни. В анкетировании приняли участие 100 студентов ЕНУ им.Л.Гумилева. Практическая значимость этого исследования заключается в его потенциале для информирования образовательных стратегий, содействующих созданию более интерактивной и персонализированной учебной среды. Будущие исследования могут быть посвящены адаптивным сетевым сообществам для дальнейшего совершенствования образовательных практик в цифровую эпоху.

Ключевые слова: Web 2.0, Web 3.0, изучение иностранных языков, образовательные технологии, сетевые сообщества, высшее образование, семантическая сеть, интерактивное обучение.

Introduction

In the context of the informatization and computerization of modern society and the increasing role of information and communication technologies (ICT) in ensuring educational processes, the strategic orientation and priority tasks of the education system in various subject areas, including foreign languages, are undergoing significant changes. The primary focus is on creating pedagogical conditions that promote continuous self-development within the framework of a competency-based approach to education, regardless of a person's place of residence, self-regulation skills, and ability to control autonomous learning activities without direct teacher involvement. Additionally, it emphasizes the development of creative and critical thinking, conscious learning, and essential skills such as navigating the global information and educational space, critically evaluating and effectively processing the ever-growing amount of information from various sources, and constructing an individual learning trajectory to acquire the necessary knowledge, abilities, and skills. To achieve these goals, a significant role is assigned to pedagogical technologies and innovative work methods based on integrating Internet tools and resources into the educational process, providing a unique environment for learning foreign languages. (Makoveyeva, 2012: 164).

However, the phenomenon of the *"network community"*, its ubiquitous use, and presence remain understudied, creating a gap in understanding and effectively using network interactions in the educational process (Rostovykh et al., 2010: 15).

The purpose of this study is to explore the phenomenon of the network community in the context of the educational process and determine its impact on the development of modern educational technologies. To achieve this goal, the following tasks need to be addressed: analyzing existing scientific approaches to the concept of "network community", studying the role of network communities in the modern educational process, determining the impact of network communities on personalization and individualization of learning, and assessing the effectiveness of using network communities for the development of distance learning technologies.

The novelty of this research lies in a comprehensive approach to studying the phenomenon of

the network community in education, including the analysis of various scientific perspectives and practical aspects of using network technologies to improve the educational process. The study develops recommendations for the effective implementation of network communities in the educational environment to enhance the quality and competitiveness of educational services.

The practical significance of the research lies in the potential application of the results to improve the organization of the educational process, develop new teaching methods and tools, and create conditions conducive to self-education and internal motivation of students. The research results can be used to increase the effectiveness of distance learning and create a more transparent and manageable educational environment.

The next sections are organized as following: literature review examines existing theoretical and practical approaches to studying network communities and their role in the educational process. Research methodology describes the methodological approaches used for data collection and analysis. Research results and further discussion present the results of data analysis and discuss the main findings. Conclusion summarizes the study, formulates conclusions, and provides recommendations for further research and practical application.

Literature review

In the early days of the Internet, the first version known as Web 1.0 was developed. Web 1.0 was designed primarily for use by companies rather than individuals. At that time, only a few people knew how to work with and use the Internet. Most large corporations hired computer specialists to manage the Internet and ensure its use within the company for employee activities.

In this initial version, there were very few content creators and a vast number of viewers. This version might seem primitive to the new generation, which is now familiar with the widespread and user-friendly Internet we know today. Advertising on websites was prohibited, most pages were created using HTML, and only information could be coded.

The Internet was also expensive at that time, as users were charged based on the number of pages viewed. For this reason, devices like computers and the Internet were rare in homes, as not everyone could afford them. Web 1.0 lasted from 1989 to 2005.

Web 2.0 marked a significant leap forward from 1.0, changing the world's perception of the Internet. It became more widespread, offering various information, user interaction, content creation, and blogging. Tim Berners-Lee envisioned the World Wide Web, and social networking sites became prevalent.

Social networking sites like Facebook, YouTube, Twitter, and others were launched around this time when the Internet became less expensive and more widespread. Wealthier families invested in internet cables, and the new content creation capabilities in version 2.0 made content creators more commonly used for entertainment and work. Eventually, Web 2.0 expanded, leading to the development of the next version.

The future of the World Wide Web is Web 3.0. Following 2.0, the third version will be based on intelligent computer applications like artificial intelligence. It aims to create a user-friendly, data-driven interface and serve everyone who uses the platform. It is designed to use blockchain, 3D graphics, the metaverse, and the Semantic Web.

Currently, some features of version 3.0 are already being implemented. With the spread of blockchain technology in various applications and sites like PayPal, Microsoft, Amazon, etc., we see the integration of 3.0 toolsets. Decentralization is the foundation of version 3.0, where everyone can use the Internet as they see fit (Aljawarneh, 2020: 57).

Web 3.0 (also known as Web3) is a next-generation internet technology that leverages machine learning, artificial intelligence (AI), and blockchain technology. The term was coined by Gavin Wood, the founder of Polkadot and co-founder of Ethereum. While Web 2.0 focuses on user-generated content hosted on centralized websites, Web 3.0 promises to give users full control over their data on the web.

This concept aims to create open, interconnected, intelligent websites and applications with enhanced data analysis capabilities through machine learning. Decentralization and the digital economy are also fundamental aspects of Web 3.0, as they allow the content created on the web to gain value. It's important to note that Web 3.0 is an evolving concept without a single definitive definition, and it is currently interpreted in various ways.

Web 3.0 will provide personalized and relevant information quickly by utilizing artificial intelligence and advanced machine learning techniques. Effective search algorithms and the development of data analytics will enable computers to better

understand user needs and recommend appropriate content. Web 3.0 will also focus on protecting content ownership rights and supporting an accessible digital economy.

Currently, websites such as forums and social networks typically contain static information or user-centric content. While this structure allows for the dissemination of information to a broad audience, it may not meet the specific needs of individual users. A website should tailor the information it provides to each individual user, similar to real human communication. In Web 2.0, users lose ownership and control over their information once it is posted online.

We can highlight the following characteristics, placed in the Table 1 below.

Table 1 – Characteristics of each Web version

Web Version	Primary Object	Characteristics	Tools
Web 1.0	Information	Internet users directly access websites created by a small group of web developers; most users act as information consumers.	Static websites, HTML, e-mail, portals
Web 2.0	User interaction	The focus shifts from pure information to user interaction; besides web developers, internet users also become content authors, enriching content and making user interfaces simpler and more accessible.	Blogs, wikis, social media platforms, AJAX, Flash
Web 3.0	Direct and personal interaction with network	User interaction is built on the semantic web, representing a network over the network containing metadata about all network resources, allowing direct and personal interaction.	Semantic web technologies, RDF, OWL, SPARQL, AI-based tools
Web 4.0	Synergy of social and virtual tools	Transcend information technologies, combining social and virtual tools based on humanities (philosophy, sociology, economics, ecology, healthcare, psychology, law, etc.).	IoT, AI, blockchain, virtual reality, augmented reality, advanced AI
Sources: Oktaviani et al, 2021: 110; Kankaya & Karadakovan, 2020: 884			

The pedagogical potential of forums and social networking communities, such as Facebook, is significant. These tools not only promote the development of multiliteracy skills, socio-pragmatic competence, and cultural enrichment in a foreign language but also foster a sense of community among learners. This sense of community is crucial for achieving native-like communicative competence in today's technologically-driven society (Sepasgozar, 2020: 4678).

Computer Mediated Communication (CMC) technologies can positively impact foreign language classrooms by providing meaningful social experiences. These interactions are essential for language learners, offering them a platform to practice and enhance their skills in real-time communication settings (Arnold and Ducate, 2006: 45).

CMC in language learning offers notable advantages over traditional environments without ICT. Studies indicate that CMC reduces barriers and inhibitions in classrooms, boosting learner confidence (Yerofeyeva, 2023: 10; Abdulgarimov et al, 2024: 167). It encourages active use of the target language, resulting in more coherent and complex language structures (Yakubboyeva, 2023: 184; Vezuyev, 2023: 558; Warschauer & Kern, 2000). Additionally, CMC enhances intercultural competence (Belz, 2003; O'Dowd, 2003: 120; Liauw, 2006: 50; Müller-Hartmann, 2000: 130).

Research has explored asynchronous tools like e-mail and discussion boards, highlighting their role in language learning (Belz, 2003; Biesenbach-Lucas, 2005: 30; Arnold & Ducate, 2006: 45; Aravind & Bhuvaneswari, 2023). Recent studies emphasize synchronous CMC (SCMC), particularly text chats, for improving syntactic, discourse, grammatical, lexical, and intercultural skills (Mynbayeva, 2020: 3; Sarsekeyeva et al, 2022: 111; Belz & Thorne, 2006; Kazimova, 2021: 26).

SCMC, such as chat tools, is considered superior for negotiating intercultural meaning due to instant resolution of misunderstandings (Kazimova, 2018: 25). Thorne (2003) noted a preference for chat over e-mail for building interpersonal relationships.

Few studies have explored audiographic and audio conferencing for language learning (Mussina, 2023: 75; Itinson, 2020; Lamy, 2004). Research on video conferencing remains limited (Karchagin & Turushev, 2021: 30).

Given the above, it can be asserted that online network communities represent a powerful tool that must be used in the education system in various interpretations and as an additional resource that allows integrating the principle of "lifelong learning" into the self-education system of educators. Further research in this subject area can focus on studying adaptive network communities, forming a qualitatively new form of interaction in the network without division by nature or management and organization methods of network communities. By creating a successful model based on the principles of adaptability and individualization of network interaction processes, one of the goals of the modern education system can be achieved.

For an ICT project to succeed in education, it must be grounded in a robust socio-cognitive and pedagogical framework. Technology should be a tool to enhance and accelerate learning, not an end in itself. Our theoretical framework is based on *Social Constructivism and Second Language Acquisition Research (SLAR)*.

Social constructivism posits that learning occurs through social interactions and collaborative tasks (Vygotsky, 1978). Authentic tasks and collaboration help construct knowledge (Itinson, 2020). Effective tasks require mutual interaction, interdependence, and shared responsibility (Abderrahim & Plana, 2021: 39). SLAR emphasizes interaction as key to language acquisition. Ellis (2005) claims that Successful SLA involves several conditions, depicted in Figure 1 below.

Each cycle corresponds to specific tasks such as:

1. Exposure to comprehensible, rich, and varied input (Karabaeva, 2020: 127).
2. Opportunities to produce contextually appropriate output (Nakesheva, 2020: 257).
3. Chances to negotiate meaning and use the target language in authentic contexts (Kublasheva et al, 2022; Mukhambetalina et al, 2024:139).
4. Focus on form, integrating meaning-focused approaches with attention to language structure (Jie, 2020: 830).
5. Addressing intercultural and pragmatic aspects to avoid misunderstandings and improve communication.

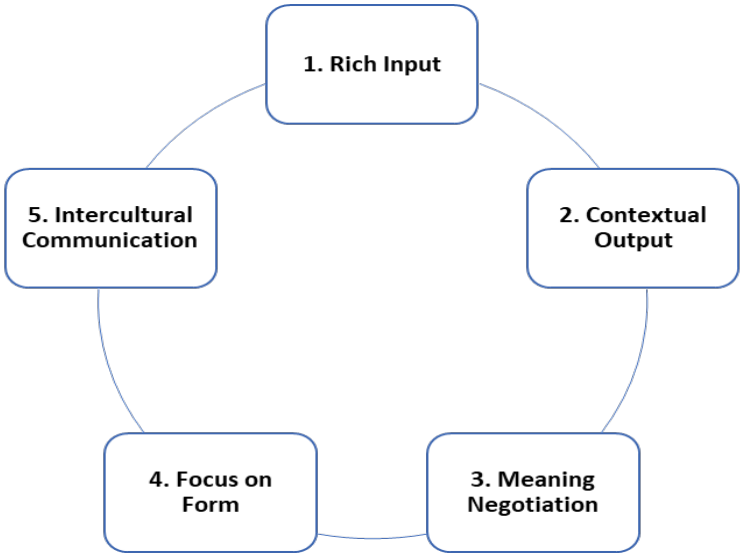

Figure 1 – Conditions for successful SLA implementation (Ellis, 2005)

The integration of Social Constructivism and SLA research creates a robust theoretical framework for this study. By leveraging Web 2.0 and Web 3.0 technologies, the study aims to provide a comprehensive learning experience that addresses the cognitive, social, and linguistic needs of students. The technologies enable a dynamic and interactive learning environment where students can receive rich input, engage in meaningful output, and participate in authentic interactions (see Figure 2).

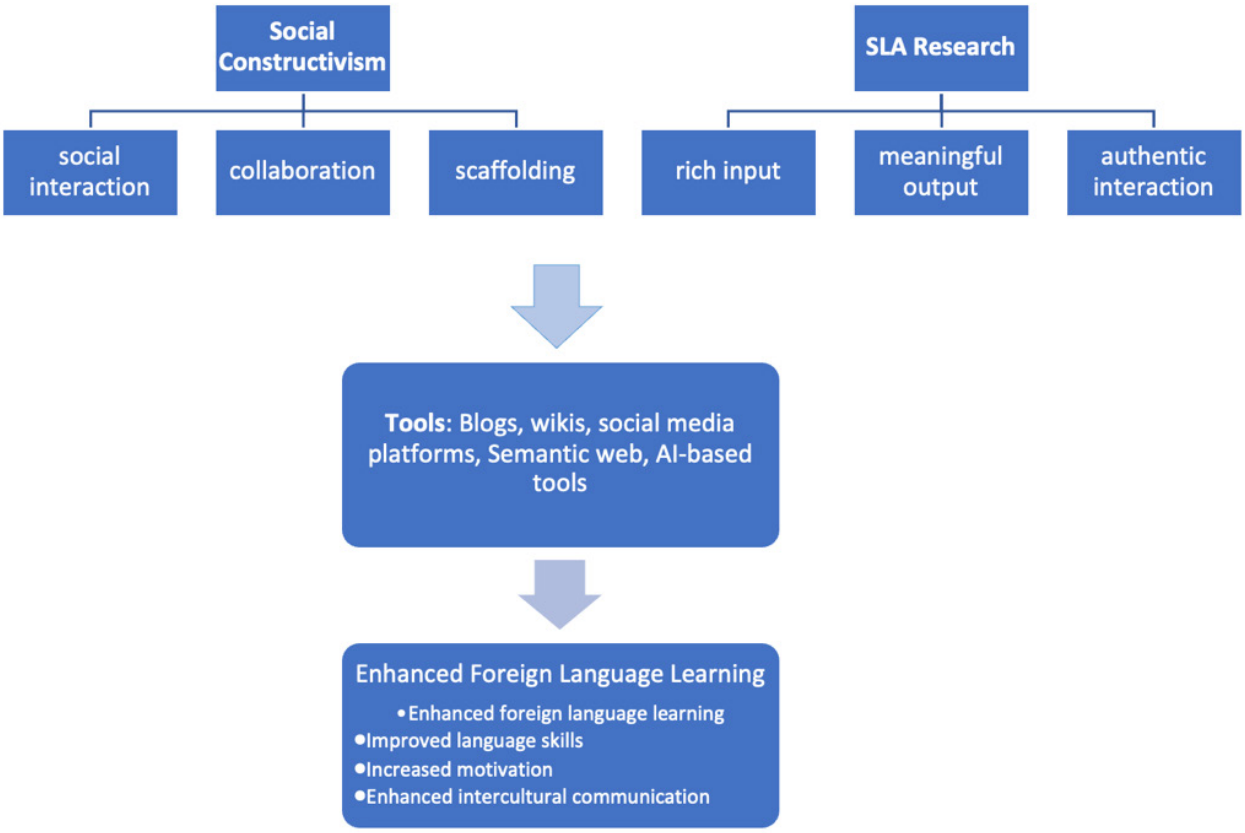

Figure 2 – Integration of Social Constructivism and SLA Theories Through Web 2.0 and Web 3.0 Technologies
Source: made by the authors

Materials and Methods

The study aims to explore the effectiveness of Web3 tools in foreign language learning, the interaction dynamics among participants, the quality and depth of intercultural communication and understanding, and participants' feedback on the use of Web3 technology compared to traditional methods.

Methodology of this study was made two-fold:

1. Empirical investigation of the essence of Web2 and Web3 technologies with the further analysis of characteristics of each version.

Using the theoretical framework which was developed from two theories: Social Constructivism and Second Language Acquisition Research (SLAR), authors developed the conceptual framework that includes specific tools used and potential outcomes. Moreover, the questionnaire was developed within this framework (refer to Appendix A);

2. Experimental part.

The experiment took place at L.N. Gumilyov Eurasian National University, spanning the period from January to April 2024, involving 100 students from faculties, focused on language learning and other faculties.

3.1 Research design

The research adopts a quantitative approach to gather experiences and perceptions of the participants.

3.2 Participants/sample

The study involves 100 university students who participated in the project at L.N. Gumilyov Eurasian National University. The sample was selected based on their enrollment in specific courses that incorporated Web3 technology for interaction sessions.

3.3 Data collection methods

Quantitative data were collected from three sources.

Firstly, participants completed a 31-item questionnaire after the project concluded, consisting of questions corresponding to a 5-point Likert scale, where 1 indicates a negative or low value, and 5 indicates a positive or high value. Additionally, sessions were recorded to capture real-time interactions and communications. During the experiment, students published their outputs, including texts with questions and answers, as well as reflections on issues discussed during the interaction sessions, on the project blog.

The questionnaire addressed various aspects of the project, including an assessment of the participants' usage of Web2 and Web3 tools at L.N. Gumilyov Eurasian National University and in their private life, and an evaluation of the overall project and the specific Web2 and Web3 e-platform used. It also gathered feedback on the designed tasks and their effectiveness.

For blog postings, students were required to publish their outputs on the project blog, which included texts with their questions and answers from interaction sessions, and reflections on the issues raised during the interaction sessions.

3.4 Interaction sessions

Interaction sessions were conducted using Web3 technology platforms. The sessions were recorded to capture real-time communication, collaborative tasks, and problem-solving activities.

3.5 Data analysis

Data were analyzed through SPSS 28.0 statistical software to evaluate the effectiveness of Web3 tools in foreign language learning and understanding the participants' feedback on the use of Web3 technology compared to traditional methods.

3.6 Ethical considerations

Ethical considerations were addressed by obtaining informed consent from all participants, ensuring confidentiality, and securing ethical approval from the university's ethics committee.

3.7 Limitations

Potential limitations of the study include the self-report nature of the questionnaire, which may introduce bias, and the specific sample demographic, which may limit the generalizability of the findings.

Results and Discussion

In this project, students engage in tasks designed around social constructivism. Tasks were developed to emphasize collaboration and reflection on intercultural similarities and differences. Effective task design is guided by criteria from Ellis (2003). The chosen design of tasks guarantees that tasks have language learning potential, fit learners' needs, focus on meaning, are authentic, have a positive impact, and are practical.

Task design criteria from Ellis (2003):

1. Tasks should provide opportunities for language practice, focus on form, and address intercultural issues.

2. Tasks must meet learners' needs and individual differences.

3. Tasks should enable communication, involve new information exchange, and facilitate learning.

4. Tasks should mirror real-world scenarios.

5. Tasks should be motivating, foster positive attitudes towards the target language and culture, and encourage language use.

6. Tasks should be feasible with available resources and easy to implement in the educational context.

Components of Task Design (Ellis, 2003)

1. General purposes of the task, such as exchanging intercultural information.

2. Verbal and non-verbal information provided by the task, like audio fragments or pictures.

3. How information is presented and used, whether split or shared, convergent or divergent.

4. Methods to follow while performing the task, including group or pair work and planning time.

5. Predicted outcomes

Results from completing the task, like an inter-

view publication.

Hypothetical linguistic and cognitive processes generated by the task.

A Cronbach's alpha value of 0.85 indicates a high level of internal consistency among the survey items. Values above .70 are generally considered acceptable, while values above .80 are considered good. This high Cronbach's alpha suggests that the survey items are reliably measuring the intended construct, which in this case is the overall experience and effectiveness of using Web2 and Web3 technologies in foreign language learning.

The table 2 below summarizes the descriptive statistics for the survey on Web2 and Web3 technologies in foreign language learning.

Table 2 – Descriptive statistics on the answers to questionnaire

Item	N	Minimum	Maximum	Mean	Standard Deviation
How often do you use Web2 and Web3 tools (blockchain-based apps, decentralized platforms, etc.) in your university studies?	100	1	5	3.2	1.2
How often do you use Web2 and Web3 tools in your personal life?	100	1	5	3.0	1.1
How familiar are you with blockchain technology?	100	1	5	2.8	1.3
How familiar are you with decentralized applications (dApps)?	100	1	5	2.7	1.4
How comfortable are you using Web2 and Web3 tools for educational purposes?	100	1	5	3.1	1.2
Have you used any blockchain-based communication tools before this project?	100	1	5	2.5	1.3
How do you rate the accessibility of Web2 and Web3 tools provided by the university?	100	1	5	3.4	1.1
How do you rate the reliability of Web2 and Web3 tools used in this project?	100	1	5	3.2	1.2
Do you feel that Web2 and Web3 tools enhance your learning experience compared to traditional tools?	100	1	5	3.3	1.2
How easy was it to integrate Web2 and Web3 tools into your existing study routine?	100	1	5	3.0	1.1
Do you think Web3 technology has a positive impact on your language learning?	100	1	5	3.1	1.2
How likely are you to continue using Web2 and Web3 tools in your future studies?	100	1	5	3.4	1.1
How would you rate the overall effectiveness of the Web3 e-platform used in this project?	100	1	5	3.5	1.0
How user-friendly was the Web3 e-platform?	100	1	5	3.6	0.9
How well did the Web3 e-platform support collaborative tasks?	100	1	5	3.3	1.1
How satisfied are you with the security and privacy features of the Web2 and Web3 e-platforms?	100	1	5	3.2	1.2
How well did the Web2 and Web3 e-platforms facilitate communication with your peers?	100	1	5	3.4	1.1
How engaging were the tasks designed for this project?	100	1	5	3.2	1.2

Continuation of the table

Item	N	Minimum	Maximum	Mean	Standard Deviation
Did the tasks help you improve your foreign language skills?	100	1	5	3.3	1.2
Were the tasks relevant to real-world scenarios?	100	1	5	3.0	1.3
Did the tasks promote intercultural understanding?	100	1	5	3.1	1.2
How challenging were the tasks?	100	1	5	3.3	1.1
How well did you collaborate with your interaction partner?	100	1	5	3.2	1.2
Did your interaction partner provide valuable feedback?	100	1	5	3.1	1.2
How comfortable were you communicating with your interaction partner using Web3 tools?	100	1	5	3.0	1.3
Do you prefer face-to-face communication or Web3-based communication for language learning?	100	1	5	3.1	1.2
How effective do you find Web3-based communication compared to face-to-face communication?	100	1	5	3.3	1.1
How would you rate the overall organization of the project?	100	1	5	3.2	1.2
What was your overall learning experience in this project?	100	1	5	3.4	1.1
Are you interested in participating in similar projects in the future?	100	1	5	3.5	1.0
Would you recommend this project to your peers?	100	1	5	3.5	1.0
Source: made by the authors					

The results present descriptive statistics for a survey conducted among 100 respondents at L.N. Gumilyov Eurasian National University. The survey assessed the frequency, familiarity, comfort, and overall effectiveness of using Web2 and Web3 technologies in foreign language learning.

The respondents frequently used Web2 and Web3 tools in their university studies, with a mean score of 3.2 out of 5 and a standard deviation of 1.2. In their personal lives, the frequency of use was slightly lower, with a mean score of 3.0 and a standard deviation of 1.1. The familiarity with blockchain technology and decentralized applications (dApps) was moderate, with mean scores of 2.8 and 2.7, respectively, and higher standard deviations (1.3 and 1.4), indicating varied levels of knowledge among the participants.

Comfort levels with using Web2 and Web3 tools for educational purposes were fairly high, with a mean score of 3.1 and a standard deviation of 1.2. However, prior usage of blockchain-based communication tools was less common, reflected in a lower mean score of 2.5 and a standard deviation of 1.3.

The accessibility and reliability of Web2 and Web3 tools provided by the university were rated positively, with mean scores of 3.4 and 3.2, respectively, and relatively low standard deviations. The tools were perceived to enhance the learning experience, as indicated by a mean score of 3.3 and a standard deviation of 1.2. The integration of these tools into existing study routines was also considered manageable, with a mean score of 3.0 and a standard deviation of 1.1.

Participants felt that Web3 technology positively impacted their language learning, with a mean score of 3.1 and a standard deviation of 1.2. There was a high likelihood of continued usage of these technologies in future studies, reflected by a mean score of 3.4 and a standard deviation of 1.1. The overall effectiveness and user-friendliness of the Web3 e-platform were rated highly, with mean scores of 3.5 and 3.6, respectively, and lower standard deviations (1.0 and 0.9).

The support for collaborative tasks provided by the Web3 e-platform received a mean score of 3.3 and a standard deviation of 1.1. Satisfaction with the

security and privacy features of the platforms was positive, with a mean score of 3.2 and a standard deviation of 1.2. The facilitation of peer communication by the platforms was also rated well, with a mean score of 3.4 and a standard deviation of 1.1.

The tasks designed for the project were found to be engaging and beneficial for improving foreign language skills, with mean scores of 3.2 and 3.3, respectively, and standard deviations of 1.2. The tasks' relevance to real-world scenarios was slightly lower, with a mean score of 3.0 and a higher standard deviation of 1.3, indicating some variability in perceptions. The promotion of intercultural understanding and the challenge level of the tasks were rated moderately, with mean scores of 3.1 and 3.3, respectively.

Collaboration with interaction partners was effective, with a mean score of 3.2 and a standard deviation of 1.2. The feedback provided by partners was considered valuable, with a mean score of 3.1 and a standard deviation of 1.2. Communication comfort using Web3 tools was moderate, with a mean score of 3.0 and a standard deviation of 1.3. Preferences for face-to-face versus Web3-based communication were balanced, with a mean score of 3.1 and a standard deviation of 1.2. The effectiveness of Web3-based communication compared to face-to-face was rated at a mean of 3.3 and a standard deviation of 1.1.

The overall organization of the project received a mean score of 3.2 and a standard deviation of 1.2. Participants' overall learning experience in the project was rated positively, with a mean score of 3.4 and a standard deviation of 1.1. There was a high interest in participating in similar future projects and recommending this project to peers, with mean scores of 3.5 and 3.5, respectively, and standard deviations of 1.0 for both.

Overall, the survey results indicate a positive reception and effective integration of Web2 and Web3 technologies in foreign language learning at L.N. Gumilyov Eurasian National University. The findings suggest that these technologies enhance the learning experience, facilitate collaboration, and are well-received by students, highlighting their potential in higher education.

Conclusion

The rapid development of information and communication technologies, including Web 2.0 and Web 3.0, has significantly impacted the process of learning foreign languages. The study conducted at L.N. Gumilyov Eurasian National University demonstrated that using these technologies considerably enriches the educational process, contributing to the improvement of students' language skills.

Students participating in interactive sessions using blogs, wikis, social media platforms, and semantic web technologies reported improvements in their learning activities and increased engagement levels. Quantitative data collected through questionnaires and blog reflections confirmed that these tools facilitate more effective and personalized learning compared to traditional methods.

Moreover, the study emphasizes the need for continuous pedagogical adaptation to successfully integrate these technologies into the educational process. This not only supports the principle of lifelong learning but also helps create a more interactive and motivating learning environment.

Based on the results of the research, we developed recommendations on using Web2 and Web3 education for students when learning a foreign language:

1. Implement regular training sessions for educators to familiarize them with the latest Web 2.0 and Web 3.0 technologies and their applications in language learning.
2. Encourage the integration of various digital tools such as blogs, wikis, and social media platforms into the curriculum to enhance interactive learning.
3. Develop personalized learning plans that utilize these technologies to cater to the individual needs and learning paces of students.
4. Promote collaborative projects and interactive sessions among students using Web 3.0 platforms to foster a more engaging learning environment.
5. Establish robust feedback mechanisms through digital platforms to continuously gather student input and improve the use of these technologies.
6. Encourage ongoing research into the effectiveness of these technologies in different educational contexts to continually refine and adapt teaching methods.

The practical significance of the study lies in its potential to inform educational strategies that foster a more interactive and personalized learning environment. By implementing the recommended strategies, educational institutions can enhance the learning experience, improve language skills, and better prepare students for the demands of the digital age. Future research can focus on adaptive network com-

munities to further enhance educational practices in the digital era.

Authors' Contributions

Ayasheva D.B.: Collected initial data and reviewed the literature. Responsible for writing the article text according to academic standards.

Nurkenova S.S.: Organized the article structure and summarized the final work.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Supplementary materials

Appendix A. Questionnaire for evaluating Web2 and Web3 technologies in foreign language learning

1. How often do you use Web2 and Web3 tools (blockchain-based apps, decentralized platforms, etc.) in your university studies?

- 1 (Never) – 5 (Very Often)

2. How often do you use Web2 and Web3 tools in your personal life?

- 1 (Never) – 5 (Very Often)

3. How familiar are you with blockchain technology?

- 1 (Not Familiar) – 5 (Very Familiar)

4. How familiar are you with decentralized applications (dApps)?

- 1 (Not Familiar) – 5 (Very Familiar)

5. How comfortable are you using Web2 and Web3 tools for educational purposes?

- 1 (Not Comfortable) – 5 (Very Comfortable)

6. Have you used any blockchain-based communication tools before this project?

- 1 (Never) – 5 (Very Often)

7. How do you rate the accessibility of Web2 and Web3 tools provided by the university?

- 1 (Very Inaccessible) – 5 (Very Accessible)
8. How do you rate the reliability of Web2 and Web3 tools used in this project?
- 1 (Very Unreliable) – 5 (Very Reliable)
9. Do you feel that Web2 and Web3 tools enhance your learning experience compared to traditional tools?
- 1 (Strongly Disagree) – 5 (Strongly Agree)
10. How easy was it to integrate Web2 and Web3 tools into your existing study routine?
- 1 (Very Difficult) – 5 (Very Easy)
11. Do you think Web3 technology has a positive impact on your language learning?
- 1 (Strongly Disagree) – 5 (Strongly Agree)
12. How likely are you to continue using Web2 and Web3 tools in your future studies?
- 1 (Very Unlikely) – 5 (Very Likely)
13. How would you rate the overall effectiveness of the Web3 e-platform used in this project?
- 1 (Very Ineffective) – 5 (Very Effective)
14. How user-friendly was the Web3 e-platform?
- 1 (Very Difficult to Use) – 5 (Very Easy to Use)
15. How well did the Web3 e-platform support collaborative tasks?
- 1 (Very Poorly) – 5 (Very Well)
16. How satisfied are you with the security and privacy features of the Web2 and Web3 e-platforms?
- 1 (Very Dissatisfied) – 5 (Very Satisfied)
17. How well did the Web2 and Web3 e-platforms facilitate communication with your peers?
- 1 (Very Poorly) – 5 (Very Well)
18. How engaging were the tasks designed for this project?
- 1 (Not Engaging) – 5 (Very Engaging)
19. Did the tasks help you improve your foreign language skills?
- 1 (Not at All) – 5 (Very Much)
20. Were the tasks relevant to real-world scenarios?
- 1 (Not Relevant) – 5 (Very Relevant)
21. Did the tasks promote intercultural understanding?
- 1 (Not at All) – 5 (Very Much)
22. How challenging were the tasks?
- 1 (Not Challenging) – 5 (Very Challenging)
23. How well did you collaborate with your interaction partner?
- 1 (Very Poorly) – 5 (Very Well)
24. Did your interaction partner provide valuable feedback?
- 1 (Not at All) – 5 (Very Much)
25. How comfortable were you communicating with your interaction partner using Web3 tools?
- 1 (Not Comfortable) – 5 (Very Comfortable)
26. Do you prefer face-to-face communication or Web3-based communication for language learning?
- 1 (Strongly Prefer Face-to-Face) – 5 (Strongly Prefer Web3-Based)
27. How effective do you find Web3-based communication compared to face-to-face communication?
- 1 (Much Less Effective) – 5 (Much More Effective)
28. How would you rate the overall organization of the project?
- 1 (Very Poor) – 5 (Very Good)
29. What was your overall learning experience in this project?
- 1 (Very Poor) – 5 (Very Good)
30. Are you interested in participating in similar projects in the future?
- 1 (Not Interested) – 5 (Very Interested)
31. Would you recommend this project to your peers?
- 1 (Not at All) – 5 (Very Much)
32. Gender
Male
Female

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