The influence of digital technologies on the improvement of communication skills of students in the process of foreign languages studying (in non-linguistic higher educational institutions)

La influencia de las tecnologías digitales en la mejora de las competencias comunicativas de los estudiantes en el proceso de estudio de lenguas extranjeras (en centros de enseñanza superior no lingüística)

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Abstract

The study aims to analyse the influence of digital technologies on the improvement of students' communication skills during foreign language studies in non-linguistic educational institutions. The questionnaire-based survey and the method of expert evaluation of the competencies formation were used. Student's coefficient and correlation analysis were used for statistical data analysis. The reliability and validity of the instruments were checked using Cronbach's alpha. The study showed that the use of Linguee contributes to the development of foreign language communicative competence of students of non-linguistic higher educational institutions. Linguistic competence ($t \approx 6.71$), Cultural sensitivity ($t \approx 7.21$), Adaptability ($t \approx 7.46$), and Communication efficiency ($t \approx 6.36$) exceed critical value $t_{critical} \approx 2.447$ at $\alpha = 0.05$. In such a way, the difference in the assessment between the groups is statistically significant,

with a significance level of α=0.05. The positive influence of the Linguee platform on the formation and development of students' communication skills was found in studies in non-linguistic higher educational institutions. The results confirm that the use of digital tools in the educational process contributes to the improvement of students' communicative competence. Further studies can be oriented on a deeper understanding and optimisation of the influence of digital technologies on the development of communication skills.

Keywords: educational environment, innovation, foreign language competence, higher education, digital environment.

Resumen

El objetivo del estudio es analizar la influencia de las tecnologías digitales en la mejora de las competencias comunicativas de los estudiantes durante los estudios de lenguas extranjeras en centros de enseñanza no lingüística. Se utilizó la encuesta basada en un cuestionario y el método de evaluación por expertos de la formación de competencias. Para el análisis estadístico de los datos se utilizaron el coeficiente de Student y el análisis de correlación. La fiabilidad y validez de los instrumentos se comprobaron mediante el alfa de Cronbach. El estudio demostró que el uso de Linguee contribuye al desarrollo de la competencia comunicativa en lenguas extranjeras de los estudiantes de centros de enseñanza superior no lingüística. La competencia lingüística (t≈6,71), la sensibilidad cultural (t≈7,21), la adaptabilidad (t≈7,46) y la eficacia comunicativa (t≈6,36) superan el valor crítico tcritical≈2,447 a α=0,05. De tal forma, la diferencia en la valoración entre los grupos es estadísticamente significativa con un nivel de significación de α=0,05. Se constató la influencia positiva de la plataforma Linguee en la formación y el desarrollo de las competencias comunicativas de los alumnos, que estudian en centros de enseñanza superior no lingüísticos. Los resultados recibidos confirman el hecho de que el uso de herramientas digitales en el proceso educativo contribuye a la mejora de la competencia comunicativa de los estudiantes. Futuros estudios pueden orientarse a una comprensión más profunda y a la optimización de la influencia de las tecnologías digitales en el desarrollo de las competencias comunicativas.

Palabras clave: entorno educativo, innovación, competencia en lenguas extranjeras, educación superior, entorno digital.

Introduction

Relevance

The relevance of the theme of the influence of digital technologies on the improvement of communication skills of students in the process of studying foreign languages in non-linguistic educational institutions is extremely important nowadays. Higher educational institutions face the constant challenge of necessity to respond to the increasing demand for professionals with profession-oriented skills, which include the ability to interact in the international environment and adapt to various cultural contexts (Lee, 2019; Shadiev & Wang, 2022).

It is important to develop the ability to use various informational resources and multimedia technologies for the effective study of foreign languages in the educational space. That is necessary not only for linguistic experience enhancement but also for the formation of key competencies such as critical thinking, independence and creativity. The use of information and communication technologies in studying foreign languages allows students to form a professional culture, as well as ensures a possibility of access to Internet resources, expanding their knowledge and enhancing their perception of foreign language communication (Slipetska et al., 2023).

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Modern digital technologies in foreign language teaching become not only a tool but an important component of the pedagogical process. They enable the revision of traditional methods of teaching and contribute to innovations and integration in pedagogical practice. Still, to achieve optimal results, not only should technologies be introduced, but students should also be taught to critically evaluate information and develop skills in teamwork and effective communication in the network environment (Chen et al., 2020).

The problem of this study goes beyond simple technology integration in the educational process. It relates to the complex of factors, defining the success of this process and ensuring the formation of effective communication skills of students.

First, there is an issue of unequal access to digital technologies among students. Some of them have better access to computers, tablets and other gadgets, while others can face difficulties due to financial problems or their location, which prevents modern technology use. Second, the quality of the content and software used in the educational process should be considered (Chen et al., 2019). It is not enough to introduce digital resources but also to ensure their quality and that they are adapted to foreign language studying and contribute to the development of communication skills. Consideration and solving these issues is an important step in the improvement of the use of digital technologies for the development of communication skills of students, contributing to more effective and multilateral foreign language studying (Klimova et al., 2023).

This study is focused on the study of the particular influence of digital technologies on the improvement of communication skills of students in the process of foreign languages studying in non-linguistic educational institutions. The study is directed at the evaluation of the efficiency of improvement of communication skills of students with the use of digital technologies introduced into the educational process. The study focuses on the issue of students' accessibility of digital technologies and the level of their technology literacy.

Purpose

This study aims to study and determine the particular influence of digital technologies on the improvement of communication skills of students in the process of studying foreign languages in non-linguistic educational institutions.

Tasks /questions

1. To examine the formation of digital competencies in students.
2. To examine the formation of communicative foreign language competencies according to selected criteria.
3. Correlation analysis is conducted to find the relationship between the formation of digital competence and the level of communicative foreign language competence.

Literature Review

Studying foreign languages is an inevitable part of interaction with global society, where digital technologies are developing rapidly. Understanding the influence of these technologies on communication skills is important for students' preparation for international communication.

The study by Haleem et al. (2022) gives valuable insight into the role of digital technologies in modern education. The review is dedicated to studying the influence of digital technologies on educational

processes and defines the key aspects of this influence. The authors study trends, advantages and challenges related to digital technology use in modern education. Furthermore, the article is notable for the detailed description of the influence of digital technologies on effective studying and the improvement of communication skills of students.

Zhang and Zou's work (2022) focuses on studying subtypes, objectives, and efficiency of advanced technologies for studying second and foreign languages. The authors systematically analyse technology types, their designation and their influence on the processes of language studying. Special attention is given to the means of computer-assisted studying, their interaction with students, and the achievement of the purpose of improving communication skills. This study makes an important contribution to understanding the efficiency of modern technologies within the context of foreign language studies.

Chen et al. (2019) reveal the influence of headlines and the level of English language knowledge on the efficiency of education, motivation and attitude of students towards the English language within the context of extended use of augmented reality. Their study analyses the interaction between factors such as the presence of headlines and the level of English language knowledge and their influence on the educational process in detail. The importance of studying this issue lies in expanding and understanding the influence of additional elements such as headlines and the level of English language knowledge can have on studying English as a foreign language using technologically improved methods.

Jamalai and Krish (2021) consider the use of online forums for the development of 21st-century skills within the English language course for particular purposes. The authors conduct a detailed analysis of the influence of the forum on the development of important skills such as critical thinking, communicative competence, and cooperation. The important aspect of this study is a practical approach to the introduction of an online platform for English language studying with an accent on the development of modern skills necessary in the 21st century.

In the guest editorial Shadiev et al. (2022) study the theme of creative education in authentic contexts with the use of advanced educational technologies. The authors emphasise the importance of the creation and realisation of creative educational practices related to the use of advanced technologies. This material serves as an important introduction to the stimulation of the creative process in education by modern technologies.

Shadiev and Yang's (2020) work is a review of scientific works dedicated to technology usage for the improvement of foreign language studying and teaching. The authors systematically analyse the results of previous studies, focusing on technologies which contribute to language studying and teaching. Defining key themes and conclusions, this study makes a significant contribution to understanding the efficiency of technology usage in studying foreign languages.

Yang et al. (2022) study the use of digital storytelling as an interdisciplinary project for improving skills in English language studying and the development of creative thinking in students. The authors systematically analyse the results of this method's implementation in studying, particularly its influence on language studying and the development of students' creative thinking. The study is important for understanding the way interdisciplinary approaches can improve the quality of language studying and develop the creative potential of students.

In their work, Zhang and Zou (2020) study subtypes, objectives and efficiency of advanced technologies for second and foreign languages studying. They conduct a systematic review of modern technologies and their role in language teaching. The authors provide a complex review of technology types and their influence on language teaching. The study helps to reveal possibilities and challenges related to the use of advanced technologies in studying foreign languages.

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Ma's (2021) article is dedicated to the development and implementation of the immersive method of English language teaching in higher educational institutions on the basis of artificial intelligence and machine learning in virtual reality technology. The author studies how these technologies can create an immersive educational context for students and how this influences the efficiency of language studying. The study supplements our understanding of how virtual reality technologies can improve the processes of teaching English languages in universities.

The article by Rofi'i and Herdiawan (2024) explores a new methodology that integrates hybrid synchronous and asynchronous methods to improve students' English speaking skills. The authors emphasise the importance of having developed English-speaking skills. Dynamic learning involves a combination of real-time interactions and exercises that can be performed at different times. The purpose of the study is to clarify teachers' views on the integration of hybrid methods in English language teaching, especially in the context of speaking lessons. The study was conducted in the form of a descriptive case study involving participants in semi-structured interviews and questionnaires. The findings indicate a significant influence of social and psychological factors on teachers' ability to communicate effectively online.

Analysing the article by Toleuzhan et al. (2023), it becomes clear that modern technology has significantly influenced the need to learn English, which has become an important part of education. The researchers drew attention to the various media tools used to teach language skills, and among them, they highlighted the YouTube video platform, which received the most positive ratings from students. Access to the internet allows learners to use YouTube videos as a valuable tool for developing a variety of language skills. The study focused on exploring the types of YouTube videos most watched by secondary school students in Kazakhstan to improve their English speaking skills. To achieve this goal, a mixed-methods study was used, which included video content analysis and a questionnaire survey of 288 secondary school students. The results of the questionnaire were analysed descriptively.

According to the study by Asratie et al. (2023), it can be determined that the research focused on the use of educational technology to improve speaking skills. A quasi-experimental design was used with two groups (experimental and control) and pre- and post-tests. Students in the experimental group were taught using educational technologies to develop their speaking skills, while students in the control group used traditional teaching methods.

In their study, Gamage (2020) consider the pedagogical application of the grammar-translation method as an effective instructional methodology in teaching English as a second language. The authors analyse the advantages and limitations of this method, and its efficiency in teaching grammar and developing linguistic skills. This study is useful for understanding different approaches to teaching English as a foreign language.

There is a small number of studies on certain aspects that remain understudied in the scientific environment. One such area is the influence of interactive virtual environments on students' development of critical thinking. The influence of these technologies on the development of critical thinking, as well as their interaction with general educational processes, were not sufficiently studied. Limited studies revealing the use of artificial intelligence in the process of individualised studying in detail are available in the education sphere. Such aspects as personalisation of educational material, adaptation to individual needs, and results optimisation are understudied, which prevents receiving the full volume of possibilities that innovations in this sphere can offer.

There is a growing focus in the academic literature on the use of digital technologies in education. Trends include the integration of computer-assisted methods, the use of virtual reality, and the use of interdisciplinary approaches to improve students' communication skills and creative thinking. Studies point to the importance of developing individualised educational programmes using artificial intelligence and

machine learning. Researchers note the great influence of digital technologies on foreign language learning. The use of social media and the YouTube video hosting platform is particularly noteworthy. It is also worth noting the widespread use of specialised applications for learning a foreign language.

The current study examines in detail the impact of digital technologies on educational processes, focusing on specific aspects, such as critical thinking and individualised learning, which remain under-researched. It offers practical solutions for introducing the latest technologies into the learning process, which helps to overcome the limitations of previous research, in particular in the use of interactive virtual environments and adaptive teaching methods.

Methods

Design

The study design determines the general strategy and plan according to which the scientific study will be conducted. Effective study design is a key element for receiving reliable and meaningful results. All the stages of this study are presented in Table 1.

Table 1.
Stages of the study conduction

Stage	Length	Content
Research and theoretical	June-August, 2023	A theoretical analysis of the literature of different scientific areas was conducted. A survey methodology was developed and meaningful criteria for the study were found. Preparation of data collection.
Ascertaining	September - October, 2023	Survey conduction, data collection and analysis, calculations conduction and determination of statistically significant results. Introduction of the Linguee platform in studying the experimental group for enhancing vocabulary and communication skills.
Summative	November, 2023	Drafting conclusions and formation of results of the study

Source: Developed by the authors of the article

Participants

The study was conducted on the basis of the National University of Water and Environmental Engineering. Respondents were selected using a lottery method among the students of the Foreign Languages Department. 100 students of 3rd and 4th years of study, including 25 boys and 75 girls, participated in the research-experimental work. The division into control and experimental groups was conducted after checking the digital competencies of students. Students with advanced and intermediate levels of digital competencies were assigned to the experimental group (EG), while those with elementary competencies were assigned to the control group (CG). Pedagogical conditions for the use of digital technology, namely the Linguee platform, to improve communicative foreign language competencies were used by the experimental group. The group of experts, consisting of 20 persons from the number of lecturers in the department, participated in the study. One group of lecturers worked with the groups within the process of theoretical and practical studying. Such sampling, the number of respondents and the method of control and experimental group formation contribute to receiving objective data.

Instruments

GoogleForms tool and WhatsApp messenger were used to collect responses during the survey process. Software such as 'Microsoft Excel' and 'SPSS Statistics 19.0' were used for received data entry and

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processing. All the analysis results were presented in percentages from the total number of individuals questioned, which provides a clearer and more relative view of the conclusions that were received.

The Linguee (https://www.linguee.com) platform with artificial intelligence (AI) was used as a digital technology. This interactive Internet service and online vocabulary enables users to find accurate translations and examples of terms and phrases that are used in real contexts. The main peculiarity of Linguee lies in its usage of a wide database, which contains translations of texts, previously published on the web.

Data collection

1. *Questionnaire-based survey method. Questionnaire for studying digital literacy of students* (Annex A) The questionnaire was used in this study to evaluate the level of digital competencies of students in the group of questions related to informational technology use. The aim of the survey was to collect objective and qualitative data, which allowed for an understanding of the level of digital skills mastery among study participants. Each question of the questionnaire relates to a certain aspect of digital competencies, beginning from the work on the computer to the use of applications and services for online communication. Survey results allow the conduct of a complex analysis of the level of student preparation in the sphere of digital technologies (Hollands & Escueta, 2020).
2. *Method of expert evaluation on the criteria of competencies formation* (Steinberg & Down, 2020). Conditions of foreign language communication skills formation show that the main factors influencing the efficiency of this process are represented in Table 2.

Table 2.
Criteria of foreign language communication skills formations of students of higher educational institutions

Criterion	Description
Linguistic competence	The level of foreign language knowledge, including grammar, vocabulary, and pronunciation.
Cultural sensitivity	The ability to understand and respect the cultural peculiarities of other speakers.
Adaptability	The ability to adapt linguistic skills to different situations and audiences.
Communication efficiency	The ability to accurately and clearly express one's own opinions and understand others.

Source: Developed by the authors on the basis of (Anderson et al., 2018)

Four main criteria for determining the quality of students' foreign language communication are presented in the table. Each criterion involves certain aspects, which should be considered in the evaluation of students' ability to effectively communicate in a foreign language.

The null hypothesis H_0 lies in the fact that the formation of foreign language communication skills does not depend on the digital competence of students. The alternative hypothesis H_1 lies in the fact that the formation of foreign language communication skills depends on the digital competence of students.

Analysis of data

1. **Student's coefficient**, t-statistic value, is calculated.

$$t = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}, \qquad (1)$$

Where X_1 and X_2 indicate sampling;
n_1 – number of respondents on the access control;
n_2 – number of respondents on the final control;
s stands for mean squared error:

$$s_x = \sqrt{\frac{1}{(n-1)n}\sum_{i=1}^{n}(x - x_i)^2},\qquad(2)$$

2. **Correlation analysis**. Correlation analysis is the method used to determine the level of interrelation between two or more variables. The main purpose of correlation analysis is the determination of the possible influence of the change of one variable on the change of another variable. Coefficient r is calculated according to Pearson's formula:

$$r = \frac{n(\sum XY)-(\sum X)(\sum Y)}{\sqrt{[n\sum X^2-(\sum X)^2][n\sum Y^2-(\sum Y)^2]}},\qquad(3)$$

Where n - number of observations,
$\sum$ – the sum of all values,
X and Y – values for variables.

3. **Reliability coefficient Cronbach's alpha** characterises the internal consistency of test tasks. Cronbach's alpha is calculated according to the formula:

$$\frac{N}{N-1}\left(\frac{\sigma_x^2-\sum_{i=1}^{N}\sigma_{Y_i}^2}{\sigma_x^2}\right),\qquad(4)$$

Where σ_x^2 – dispersion of the grade of the whole test;
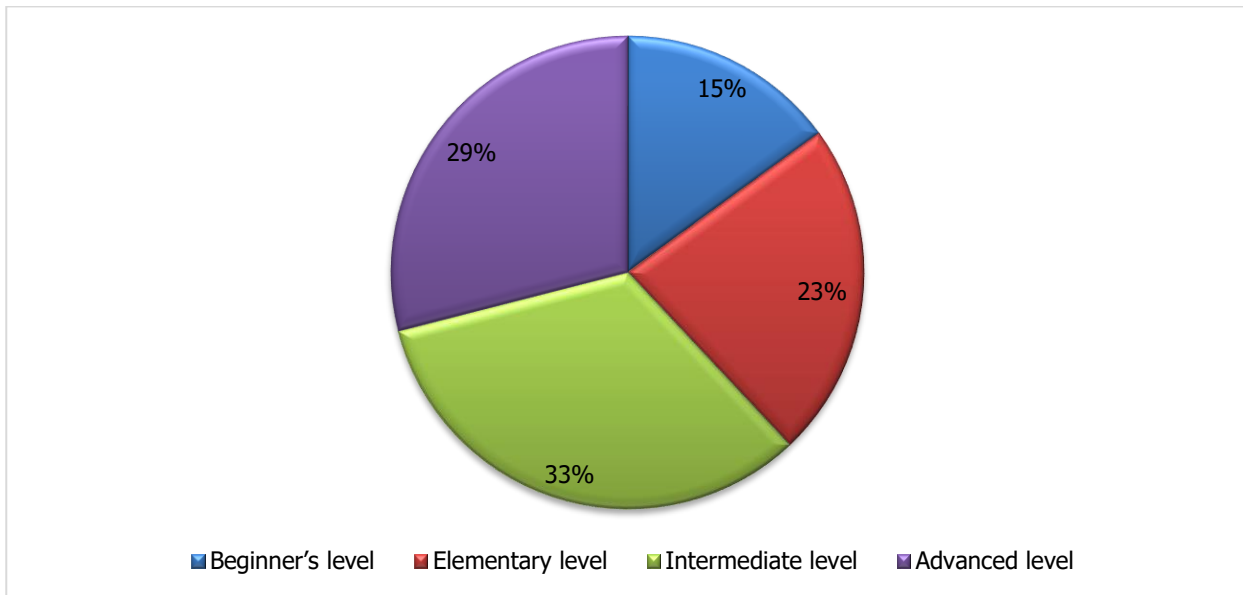$\sigma_{Y_i}^2$ – dispersion.

Ethical criteria

Ethical criteria in this study are determined to ensure the protection of the rights, well-being and dignity of its participants, as well as to ensure trust in its results and conclusions. Compliance with ethical standards is a necessary element of study conduction, which is defined by a number of key principles. The study should guarantee that participants have a complete understanding of their rights and where the received data will be used. Ensuring confidentiality and anonymity is a key aspect. The study should be based on fair and objective methods. All the results should be presented objectively, even if they do not correspond to expectations or previous hypotheses. It should be conducted in compliance with principles of equality and consideration of possible influence on different sociocultural groups. Participants sign informed consent forms before participating in the study.

Results

Respondents division based on the levels of digital competencies can reflect a wide range of different types of skills and knowledge in the sphere of digital technologies. Student division based on the level of digital competence formation is presented in Figure 1.

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Figure 1. *Student division based on the level of digital competence formation*
Source: Developed by the authors on the basis of the study results

Student division based on the digital competence level indicates the variety of skills and knowledge in this area among the audience. The following conclusions can be made based on the mentioned data. Most students have the beginner's or elementary levels of digital competence. This can indicate that a part of students can have basic or limited skills in working with digital technologies. One-third of students have an intermediate level of digital competence. This can indicate that some students have quite developed skills but still require improvement in certain aspects. Approximately one-third of students have an intermediate level of digital competence. This indicates that some students in the group have a considerable level of skills and can use digital technologies for various tasks. Analysis of such a division serves as a basis for further correlation analysis. In such a way, the experimental group consisted of 62 students, while the control group involved 38.

The study of the formation of foreign language communicative competence within the context of this study is extremely important because of several key reasons, which are defined as the ability to effectively interact using another language, which is a critical aspect under conditions of globalisation and international communication. The study of this aspect allows us to gain an understanding of the level of linguistic skills of students oriented toward studying foreign languages and their ability to use such skills in the digital environment. The consideration of students' foreign language communicative competence can contribute to the development of more effective methods of teaching and the implementation of digital tools to improve these skills. The diagram of the formation of foreign language communicative competencies for control and experimental groups at the beginning of the study is presented in Figure 2.
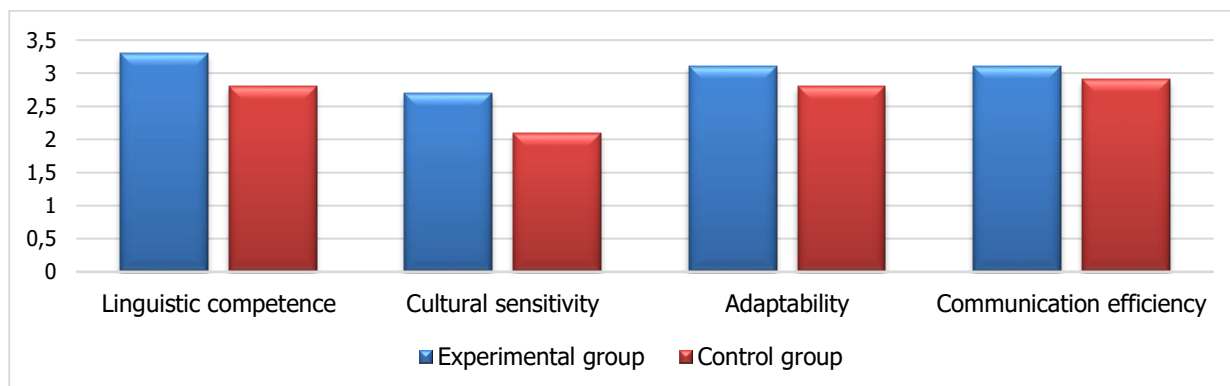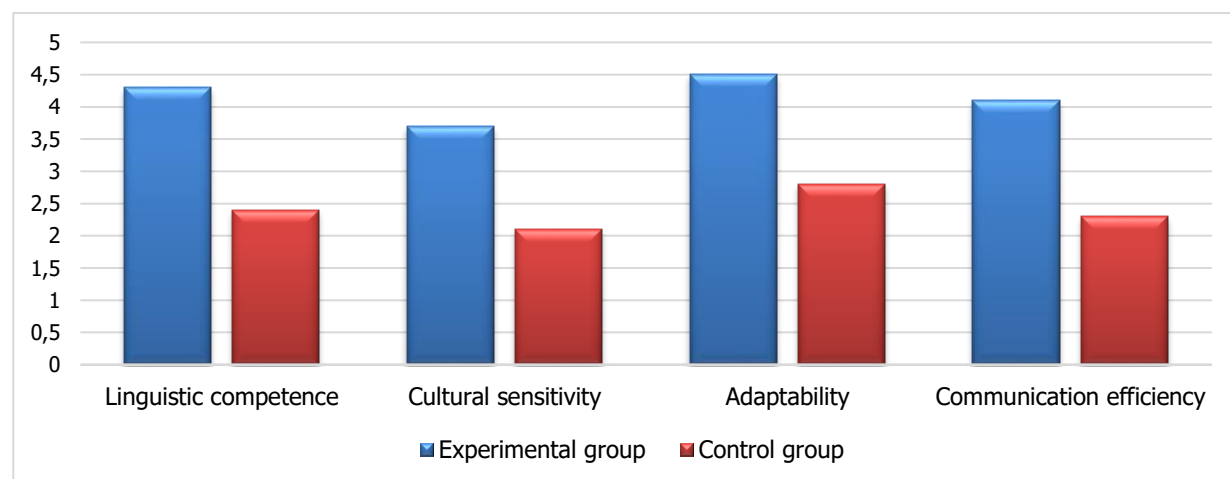
Figure 2. *The diagram of the formation of foreign language communicative competencies for control and experimental groups at the beginning of the study*
Source: Developed by the authors on the basis of the study results

Student's coefficient calculations for comparison of different parameters between EG and CG confirm that the difference in student's evaluation is not statistically meaningful with significance level a=0,05.

The calculated value for the criterion 'linguistic competence' - $t \approx 1,118$ is lower than the critical value of 2,447. The calculated value for the criterion 'Cultural sensitivity' - $t \approx 2,236$ is also lower than the critical value of 2,447. The calculated value for the criterion 'Adaptability' - $t \approx 0,894$ is lower than the critical value of 2,447. The calculated value for the criterion 'Communication efficiency' - $t \approx 0,632$ is lower than the critical value of 2,447. Thus, based on the results received, it is possible to conclude that there is no statistically significant difference between groups EG and CG, which indicates that the conditions were equal at the beginning of the experiment. The results received at the end of the experiment are presented in Figure 3.

Student's coefficient value: Linguistic competence: $t \approx 6.71$, Cultural sensitivity: $t \approx 7.21$, Adaptability: $t \approx 7.46$, Communication efficiency: $t \approx 6.36$. All t values exceed critical value $t_{critical} \approx 2,447$ with a=0,05. Thus, the difference in the assessment between the groups is statistically significant, with a significance level of a=0.05.

Figure 3. *The diagram of the formation of foreign language communicative competencies for control and experimental groups at the end of the study*
Source: Developed by the authors on the basis of the study results

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Integration of the studying of foreign language communicative competence in the study reveals how students perceive and adapt digital technologies to improve their communication and intercultural interaction. This can have important consequences for the development of educational programs and methodologies, adapted to the requirements of modern information society. The study of foreign language communicative competence of students within the context of digital technologies is a step toward more integrated and balanced education, which considers the complex requirements of the modern educational environment.

Analysis of the correlation between the levels of digital competence of students and their foreign language communicative competence is presented in Table 3. Each level of digital competence (Beginner's, Elementary, Intermediate, Advanced) was evaluated based on the relevant questionnaire questions, while foreign language communicative competence was determined according to four aspects: Linguistic competence (EG, CG), Cultural sensitivity (EG, CG), Adaptability (EG, CG) та Communication efficiency (EG, CG). Correlation values indicate possible trends of interaction between the two parameters considered in the study.

Table 3.
Correlation between the levels of digital competence of students and their foreign language communicative competence

	Beginner's level	Elementary level	Intermediate level	Advanced level
Linguistic competence (EG)	0.12	0.21	0.45	0.33
Linguistic competence (CG)	-0.07	0.09	-0.05	0.05
Cultural sensitivity (EG)	0.33	0.38	0.18	0.15
Cultural sensitivity (CG)	0.21	0.38	0.00	0.10
Adaptability (EG)	0.26	0.44	0.49	0.37
Adaptability (CG)	0.02	0.28	-0.02	0.15
Communication efficiency (EG)	0.18	0.41	0.39	0.27
Communication efficiency (CG)	0.08	0.15	0.10	0.20

Source: Developed by the authors on the basis of the study results

The analysis of the correlation between the levels of digital and foreign language communicative competencies of students provides an interesting insight into the interrelation between these two key aspects of their educational experience. The intermediate level of digital competence, in particular, was found to be interrelated with all aspects of foreign language communicative competence. This indicates that students with an intermediate level of digital skills probably have better possibilities for interaction in a foreign language environment. It is important to especially emphasise that students' adaptability has the strongest interrelation with the intermediate level of digital competence. This can indicate that students with intermediate levels of digital skills are distinguished by better preparation and ability to adapt to the international communicative environment.

It is important to note that the cultural sensitivity of students is highly correlated with elementary and intermediate levels of digital competence. This indicates that students with developed digital skills of different levels express better attention and sensitivity to cultural aspects of international communication. Although linguistic competence correlates with the level of digital competence, this relation is less expressed compared to other aspects of foreign language communicative competence. This indicates that the development of digital skills can be a less critical factor in linguistic competence formation than other aspects of international communication.

In general, it is possible to conclude that H_0 was false. The alternative hypothesis was proved. Thus, the level of digital competence affects the development of foreign language communicative competence (H_1).

Discussion

According to the recent studies by Deja et al. (2021) and Ervianti et al. (2023), almost all survey respondents were informed about everyday use of the Internet. The amount of screen time increases during weekends as expected. According to the received data, every fourth respondent spends more than 5 hours on the Internet on weekends, and every third respondent informs us about Internet use for 6-8 hours. Digital competencies, represented as search skills and skills of using digital technologies in education, play an important role in the educational process.

Works of Ferdiansyah (2019) and Bećirović et al. (2021) are dedicated to the empirical study of the influence of digital technologies on academic competencies formation. The authors conclude with a positive evaluation of the influence of multimedia on social and psychological peculiarities. Digital technologies contribute to the development of visual memory, spatial orientation, and ability to act in a situation of uncertainty and positively influence non-verbal intellect in general. It is the change in the structure of non-verbal intellect that is the indicator of the influence on psychical functions, although the influence level depends on a particular digital technology.

An et al. (2021) and Patell et al. (2022) note that excessive involvement in the digital world leads to negative emotional and social behaviour peculiarities. This position is mostly substantiated by the time consumption of such activities, which leads to the reduction of time for socialisation in the real rather than the virtual world. Within this context, statistically significant positive interrelation between the components of technotronic-digital factors should be mentioned. Based on the received data, the authors conclude that considering age peculiarities, children are unable to control and reflect the level of their involvement in a digital environment.

An ambiguous effect of the influence of the digital environment is observed in relation to memory. Studies by Zou et al. (2019) and Su (2021) evaluated the mnemonic abilities of adolescents before and after playing video games. The study showed that there were no significant differences in parameters of long-term memory between the participants groups, but participants playing aggressive video games demonstrated lower parameters of arbitrary concentration. Studies indicate that teenagers and boys playing video games demonstrate higher indicators of predictive thinking and planning skills.

A number of researchers (Wang et al., 2023; Zhao & Lai, 2023) of the influence of digitalisation on studying foreign languages state that the use of digital technologies requires students to have a high planning level, the ability to make decisions, developed information analysis skills, ability to be a situation of uncertainty, make and verify own assumptions. These requirements contribute to the development of logical thinking, multitasking and strategic planning, and a sensitive period for the development of skills and competencies.

The theoretical significance of the study lies in the expansion of the scientific understanding of the interaction of digital technologies and communication skills in students' environments. Received results

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may be used as the theoretical basis for further research in the sphere of study of the influence of technologies on the processes of student communication and development.

Practical significance

The practical significance of the study lies in the possibility of implementing the received results into certain educational and pedagogical practices. In particular, the development of new courses and educational programs oriented toward the development of digital and communication skills can establish new trends for pedagogical initiatives. Implementation of interactive technologies in the educational process can also reveal effective methods of enhancing students' level of digital competence. Exchange programs and projects that consider the development of intercultural sensitivity and digital skills can become real in an international educational environment.

Limitations

The methodological limitations of the study include some factors that influence study principles and approaches. The use of certain metrics for determination of the level of digital competence can influence results generalisation. Different approaches to digital skills evaluation can lead to different conclusions. The use of self-evaluation by students in relation to communicative competence can be subjective, and the results can be affected by personal preferences and attitudes.

While talking about instrument limitations, the following should be noted. As the data was collected using a questionnaire-based survey, there is the possibility of distortion development due to dishonest or misunderstood students' answers. The considered aspect of digital and communicative competence cannot cover all possible variations of these skills, which limits the universality of the received results. External factors, such as seasonality or curriculum changes, can influence the results or make them less representative.

Conclusion

The relevance of the study is stipulated by the task to satisfy the increasing demand for specialists with profession-oriented skills, including the ability to effectively interact in an international environment and adapt to various cultural contexts. The interaction between the levels of digital and foreign language communicative competencies of students in the educational process was studied in the work.

The results we received enabled us to draw several key conclusions. The intermediate level of digital competence was found to correlate with all aspects of foreign language communicative competence. This indicates the importance of digital skills for successful interaction in an international environment and underlines the necessity of their development among students. The strongest interaction is observed between the adaptability and intermediate level of digital competence. This indicates that students with intermediate level of digital skills have more possibilities to adapt to new challenges and situations in an international environment. As a result, the null hypothesis was refuted, and the alternative hypothesis was confirmed – digital technologies contribute to the development of communication skills of students of non-linguistic higher educational institutions. The use of digital technology, namely the Linguee platform, contributed to significant improvement of the students' communicative foreign language competencies.

The results received have a wide practical range of applications. For example, courses and educational programs oriented toward the complex development of digital and communication skills may be developed in the pedagogical sphere. The use of interactive technologies in teaching can have a positive influence on the level of digital competence of students. Future studies on this issue can be oriented toward a deeper

understanding and optimisation of the influence of digital technologies on the development of communication skills of students studying foreign languages. One of the perspectives is further study of the role of interactive and intellectual systems in the formation of effective communication between students and lecturers.

Te main limitation of the study is that students may not always objectively assess their own skills, which may affect the reliability of the results. Self-assessment can be distorted by various factors, such as subjective perception of their own abilities or a desire to present themselves in a better light. It is also important to consider the possible influence of external factors, such as the teacher's personality, learning style, or the level of students' socioeconomic background, which may affect their performance and perception of the use of digital technologies in the learning process. Also, the limitations of the sample of students located in one HEI should be taken into account. For future research, it is worth considering the possibility of involving students from several HEIs. It is worth paying attention to methodological limitations. Despite the validity and relevance of the chosen methods to the stated topic, there are still no perfect methods that would not pose a threat of inaccurate results.

In future research, it is important to consider a wider range of issues, such as examining the relationship between digital competence and different aspects of language competence, such as listening, speaking, reading and writing. It is also possible to investigate the impact of other factors, such as the accessibility and quality of learning resources and the type and form of interaction with digital technologies, on learning effectiveness and language skill development. Future research should focus on the effectiveness of MOOC platforms in improving students' foreign language competences.

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ANNEX A

Questionnaire for Studying Digital Competencies of Students.

Thank you for participating in our study. Your responses with help us to receive more information on the level of digital competencies of students.

1.   Can you work with a desktop computer?
2.   How fast do you type on a desktop PC keyboard?
3.   Do you find work with computers and other techniques to be easy?
4.   How well do you use search engines?
5.   Do you use cloud storage?
6.   Do you use Office programs?
7.   Do you use programs for text editing?
8.   Can you work with spreadsheets?
9.   Can you work with programs for presentations?
10.   Do you work with graphics software?
11.   Do you use programs for information and search engines?
12.   Do you use programs for informational security services?
13.   Are you interested in new applications, programs, and resources?
14.   Can you create digital content?
15.   Do you own an account on social networks or messengers?
16.   How frequently do you receive new information in the sphere of informational technologies?
17.   Do you know the basics of databases?

Do you use the programs as Zoom, Skype, Discord, Google Hangouts, MS Teams and their functions? (from '0' - don't know to '5' know everything)