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The Role of Digital Technologies in Building Foreign Language Competencies of Future Specialists

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ABSTRACT

Teaching and learning in the higher education environment are being fundamentally transformed by digital technologies, and the pace of technological change is aggravating the problem. The global changes caused all higher education environments to move away from traditional teaching and learning that simply no longer adapt to the challenges of a rapidly changing educational environment. This also applies to learning a foreign language. Therefore, the aim of the study was to determine the role of digital technologies in the educational process when building students' foreign language competencies. The aim was achieved by using the methods of testing, survey, observation and expert evaluation. Statistical methods of analysis were used to interpret the obtained results. The results of the study gave grounds to state that the use of digital technologies when studying a foreign language has a positive effect compared to the results of the control group who studied according to the traditional programme. It was also determined that the students of the control group highly appreciated the usefulness of technology and also noted that the teachers' support in the learning process is an important factor for successful learning of the material. The novelty of the research is that it was conducted in the conditions of offline learning and analysed how it is possible to more effectively stimulate the development of foreign language competencies with the help of digital technologies. The development of a programme using digital technologies to improve the communication skills of foreign language students can become a promising research direction.

KEYWORDS: Digital technologies, foreign language learning, competence building, higher education, foreign language.

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El papel de las tecnologías digitales en el desarrollo de competencias en lenguas extranjeras de los futuros especialistas

RESUMEN

La enseñanza y el aprendizaje en el entorno de la educación superior están siendo transformados fundamentalmente por las tecnologías digitales, y el ritmo del cambio tecnológico está agravando el problema. Los cambios globales provocaron que todos los entornos de educación superior se alejaran de la enseñanza y el aprendizaje tradicionales que simplemente ya no se adaptan a los desafíos de un entorno educativo que cambia rápidamente. Esto también se aplica al aprendizaje de una lengua extranjera. Por lo tanto, el objetivo del estudio fue determinar el papel de las tecnologías digitales en el proceso educativo a la hora de desarrollar las competencias en lenguas extranjeras de los estudiantes. El objetivo se logró mediante el uso de métodos de prueba, encuesta, observación y evaluación de expertos. Se utilizaron métodos estadísticos de análisis para interpretar los resultados obtenidos. Los resultados del estudio permiten afirmar que el uso de tecnologías digitales en el estudio de una lengua extranjera tiene un efecto positivo en comparación con los resultados del grupo de control que estudió según el programa tradicional. También se determinó que los estudiantes del grupo de control apreciaron mucho la utilidad de la tecnología y también señalaron que el apoyo de los docentes en el proceso de aprendizaje es un factor importante para el aprendizaje exitoso del material. La novedad de la investigación es que se llevó a cabo en condiciones de aprendizaje fuera de línea y analizó cómo es posible estimular más eficazmente el desarrollo de competencias en lenguas extranjeras con la ayuda de las tecnologías digitales. El desarrollo de un programa que utilice tecnologías digitales para mejorar las habilidades comunicativas de los estudiantes de lenguas extranjeras puede convertirse en una dirección de investigación prometedora.

PALABRAS CLAVE: tecnologías digitales, aprendizaje de lenguas extranjeras, desarrollo de competencias, educación superior, lengua extranjera.

Introduction

Revolutionary technological achievements undermined social industries, and also made adjustments to the social existence. The modern world can be characterized by interdependence between nations, where linguistic and cultural diversity is the underlying basis for societies. A period of global communication and decentralization of power is accelerated by social media and the rise of nationalism (OECD, 2023).

Electronic communication devices such as computers, laptops, mobile phones, the global communication system, the Internet and other technologies have become an integral

part of social life and they are becoming increasingly widespread. Digital education, as a kind of learning process with the use of electronic technologies, has appeared and significantly expanded the possibilities of language learning. It is no longer reduced only to the traditional educational environment. Education has potential both in the learning environment and in other social spheres. This is justified by the fact that students can get remote access at any time to various educational materials using various educational platforms or lectures by native speakers.

Technologization of education involves the use of digital technologies and Internet by students to complete homework, exercises or simply expand knowledge of the subject that was covered during classes. A significant role in this process is played by teachers who, with their pedagogical practice and role modelling, have an impact on the emotional, social, and intellectual development of students. Teachers should guide students to find a better approach to learning and create a positive atmosphere among students when using digital technologies (Toktamysov et al., 2023). It is also important to help students develop the ability to effectively use available resources and develop their ability to use technology during foreign language learning as an independent form of learning (Fu et al., 2021).

Therefore, the aim of the study was to determine the role digital technologies in learning a foreign language and in building foreign language competence during studies.

The aim involved the fulfilment of the following research objectives:

1. Determine the effectiveness of traditional digital technologies during studies;

2. Implement additional digital technologies in the experimental programme;

3. Compare the obtained test results before and after the experiment.

4. Determine the students' opinion regarding the teachers' attitude to the use of digital technologies.

Research hypothesis: If both teachers and students perceive the use of additional digital technologies as a positive aspect of supplementing education, it can be expected that students will have higher indicators of the foreign language competence.

1. Literature Review

The use of digital technologies evokes intense and lively interest among researchers (Balcı & Kartal, 2021; El Aouifi et al., 2021). According to the researchers,

technology has become an integral part of the modern environment for learning a foreign language because it can provide personalized language materials and instructions that enable students to choose a lesson and adapt it to their personal needs. In this way, technologies increase access to any information and increase opportunities for communication. The use of digital technologies such as radio, television, mobile phones, movies or the Internet for independent foreign language learning has various functions when forming a positive student's identity in supporting their learning motivation (Pala & Başıbüyük, 2023). Digital technology also provides students with a supportive educational community, offering a place for self-expression and improving their self-perception (Chiu et al., 2023), and facilitate the process of "online informal language learning" (Chen, 2022).

Many researchers analysed the effectiveness of using digital technologies during independent learning of a foreign language. Geng et al. (2019) found that self-directed students who share positive attitudes toward digital learning are more motivated to adopt online learning strategies and achieve their learning goals. When using educational technologies, students are more active and autonomous (Bin-Hady & Al-Tamimi, 2021; Tawafak et al., 2018). Rashid and Asghar (2016) determined that the use of technology involves independent language learning and that the use of technology indirectly affects academic performance.

However, technology integration alone is not enough. Yilmaz (2018) believes that this type of language learning has technical and pedagogical implications. Technical ones include students' skills in independent use of technology, their efforts and devices, while pedagogical implications involve educational design. So, there is a need for teachers who are able to organize and support this type of learning and have the "pedagogical knowledge" (Atmowardoyo, 2018) that should be included in such learning.

Teachers play a key role in the educational environment (Ahmetović et al., 2020). As teachers shape the pedagogical programme and also choose the way technologies will be used during learning, research shows that the effective use of digital technologies largely depends on the teachers' attitude. Ju and Mei (2018) found that teachers who have a positive attitude toward the use of educational technology are more likely to incorporate it into their teaching. Meguid and Collins (2017) support the opinion that the teacher's personal attitude is the main factor contributing to the assimilation of the implemented

technologies by students.

Therefore, the teacher's role in the application of digital technologies in the educational process is very important. Gokcearslan (2017) found that those teachers who built a programme with the help of technology make learning more effective, and students are more active and engaged in the lesson prepared in this way. Lai et al. (2012) also emphasize the importance of teachers' efforts using different educational formats.

The current situation caused by the global pandemic and the war in Ukraine has posed a serious challenge to educational institutions of all levels around the world (Ishchenko et al., 2022). The educational process has completely moved from classrooms to student homes thanks to various technological devices and online meeting platforms as the main teaching tools. This required a change in teaching methods, as well as teaching materials, which had to be adapted to this new regime. Students were also under pressure to adapt to these conditions, finding new ways to complete projects, homework and intensify participation in the classroom. All these circumstances, accompanied by recurrent problems with Internet connection, made students improve their skills of independent information search, completing assignments, and doing exercises. So, the study analyses the students' perception of this type of learning, as well as how the teachers' behaviour and support affected their results in building foreign language competence.

2. Materials and Methods

2.1. Design

The research methodology combined qualitative and quantitative empirical methods and also provided for an interpretive approach to the analysis of the obtained data. The experimental part of the study covered the period from September 2022 to the end of December 2022 (Table 1).

The following digital technologies were used during experimental part of the study, such as:

1. Use of multimedia resources (video, audio, interactive exercises and graphic materials) to enhance students' interest in the chosen topic. Audio and video files were used in order to improve students' skills necessary in listening, speaking, reading and writing in a foreign language, expressing thoughts in a foreign language, as well as communicating on given topics to enable listening to the authentic speech of native

speakers.

Table 1. Stages of research on determining the effectiveness of digital technologies in improving the foreign language competence of higher school students

Research stage	Period	Research stage description
Preparatory	July - August 2022	1. Choosing an educational environment for the experiment 2. Obtaining permission to conduct the experiment 3. Conducting an analysis of the advantages and disadvantages of digital technologies that are already used in education. 4. Search for new technologies that differ from traditional ones for implementation in the educational programme of the experimental group.
Initial	September - December 2022	1) Conducting input testing to determine students' foreign language competencies. 2) Division of students into control and experimental groups. 3) Implementation of digital technologies in the educational process. 4) Carrying out final testing to determine the level of students' foreign language competence after the introduction of digital technologies. 5) Comparison of the obtained results of control and experimental groups.
Final	January 2023	1) assessment of the obtained results. 2) Evaluation of teachers' attitude to the use of digital technologies. 3) Development of recommendations

Source: developed by the author

2. Use of mobile applications (Busuu, Duolingo, Memrise, LingoDeer, Nemo) to improve linguistic skills in any free time: mastery of lexical, phonetic, orthographic, grammatical means of a foreign language.

3. Virtual reality and 3D models were used to build students' sociocultural competence. The purpose was acquiring knowledge about the peculiarities of culture, traditions, as well as the living conditions of the population of the country whose language is being studied. not only the students' awareness of the peculiarities of the culture, traditions and living conditions of the population of the country whose language they are

studying.

2.2. Participants

The study was conducted at 5 ZVO For the reliability of the conducted experiment:

1) Southern Ukrainian National Pedagogical University named after K.D. Ushinsky;

2) State University of Trade and Economics;

3) Educational and Scientific Institute of Foreign Languages of Bohdan Khmelnitsky National University of Cherkasy;

4) Ternopil Volodymyr Hnatiuk National Pedagogical University;

5) Lesya Ukrainka Volyn National University.

The Oxford Placement Test (ORT) was used to divide students into homogeneous groups during admission. The sample consisted of 134 students studying one of the foreign languages, including English, German, French, Spanish, and Korean. A total of 65 students were included in the experimental group (EG), and 69 in the control group (CG). The sample also included 12 experts — teachers who were familiar with the methods of using digital technologies during education and the criteria for evaluating the effectiveness of their impact on building students' foreign language competence. In particular, it was determined whether students developed the necessary skills in listening, speaking, reading, and writing in a foreign language. It was also found whether the students' knowledge and skills sufficient to express their thoughts in a foreign language, as well as communicate on given topics. The extent of students' phonetic, orthographic, lexical, grammatical skills in a foreign language were measured. Students' knowledge of the peculiarities of the culture, traditions and living conditions of the population of the country whose language is studied, and the use of this knowledge during communication in a foreign language and the ability to communicate in a foreign language about their country and its population were assessed.

Students' ability to organize themselves in learning, their motivation, their activity during classes, the level of knowledge and its versatility, the ability to use the acquired knowledge in different situations, the level of critical thinking, the ability to listen and perceive a different vision of the situation, to show tolerance and benevolence during the discussion, ability to explain their point of view were assessed.

2.3. Instruments

International tests were used for testing in accordance with language chosen by the respondents. The tests consisted of 150 items, including 60 items — to check the grammar of spoken language; 30 items — for lexical substitutions; 30 items — for lexical choice; 30 reading assignments. Statistical data were processed using Microsoft Office.

2.4. Data Collection

The following methods were used to conduct the experimental part of the study:

1. The method of monitoring students' progress for determining the effectiveness of digital technologies in the development of foreign language competencies in the educational process. Methods of testing, surveys and analysis of academic performance were also used.

2. The testing method for determining the level of students' foreign language competencies, namely: checking the grammar of the spoken language, reading, and vocabulary during the experimental period of study.

3. The method of expert evaluations for analysing the results of students' educational activities. A group of experts studied the level of foreign language competence in EG and CG.

2.5. Analysis of Data

The Cronbach's alpha reliability coefficient was used To check and interpret the data obtained after the experimental part of the study, which indicates the internal consistency of the test items. Its value was 0.792, which indicates acceptable reliability. The results of the CG and EG tests were also compared.

2.6. Ethical Criteria

The chosen methods are verified for conducting research. The conducted experiment corresponds to the academic principles of professionalism, integrity, and respect for general human rights. All experiment participants gave their written consent to the personal data processing. The names of the respondents remained confidential as agreed.

3. Results

It was found during the experiment that the level of foreign language competencies of EG and CG students before the experiment were almost the same. Improved results were observed in both groups at the end of the experiment. In the control group, it is caused by the influence of traditional teaching methods, and in the experimental group — by the use of digital technologies. Nevertheless, the number of students with an unsatisfactory level of proficiency in correct pronunciation has significantly decreased in EG (5%), compared to CG (3%). The number of students who rated these indicators the highest increased by 6% in EG, compared to 1% in CG. The number of students who have the skills that are components of speech and communication competence in the EG tripled, while it doubled in the control group.

The assessment of the communication strategies chosen by the students showed that the consistency of expressed opinions was observed (22%), operating with logical personal beliefs (34%), well-chosen arguments (17%), the ability to structure the report and also to answer the questions appropriately (13%), the ability to generalize, draw conclusions and make propositions (25%) in the EG after the introduction of digital technologies. The ability to analyse information from foreign-language sources in EG also increased by 33% and successfully use vocabulary — by 21%.

The use of digital technologies affected the qualitative indicators of speech activity. These include, in particular, the relevance of statements to the given topic, the ability to improvise, the completeness of the description of the situation, the ability to use linguistic means. The experts noted that the volume of statements and their speed increased.

Table 2 shows the obtained results of the testing before and after the experiment.

Table 3 presents the results of the students' listening comprehension before and after the introduction of digital technologies.

Tables 2, 3 show that the digital technologies significantly contribute to the development of students' foreign language competencies — understanding what is heard or read in a foreign language — compared to the traditional teaching methods.

The study found that the mean square deviations from the average percentages of the same parameters, which were evaluated by experts in different academic groups, differed. Intergroup variance and intragroup variance are not equal. This shows that the null

hypothesis is not valid.

Table 2. Obtained results of reading comprehension in EG and CG

Level of understanding	EG		CG	
	Before	After	Before	After
General	45 %	6 %	44 %	39 %
Full	41 %	63 %	42 %	44 %
Detailed	13 %	30 %	14 %	17 %

Table 3. Obtained results for listening comprehension in CG and EG

Listening comprehension rate	EG		CG	
	Before	After	Before	After
Unsatisfactory	11 %	5 %	8 %	5 %
Partial	25 %	10 %	30 %	20 %
Satisfactory	48 %	24%	44 %	49 %
Incomplete	13 %	18 %	16 %	21 %
Excellent	3 %	3 %	3 %	5 %

When applying the Pearson criterion to calculate x_1^2 in the assessment of the acquired level of foreign language competence in the EG students $x_1^2 = 2,9$, and comparing it with $x_2^2 = 0,5$ obtained in the assessment of these competencies in the CG students, it was found that $x_1^2 > x_2^2$. This may indicate reasons to believe that there is a certain relationship between the use of interactive learning methods in learning a foreign language and the development of relevant abilities and skills characteristic of speech and communication competencies.

The intergroup variance is determined by the heterogeneity of the sample, namely the different conditions for the introduction of digital learning technologies in different educational groups, which ranged from 290 to 980. Cohen's d=1.0 in EG indicates the high efficiency of the used educational digital technologies for building foreign language competencies. This gives grounds to state that the implemented digital technologies are effective in the process of learning a foreign language as well as in building foreign language competencies.

When analysing the respondents' opinion regarding the use of digital technologies while learning a foreign language, the respondents gave quite high ratings for the perceived

usefulness of technological resources and are also confident in their ability to use resources during independent foreign language learning. The respondents also indicated that they have the necessary conditions for using technologies (Table 3).

Teacher support when using digital technologies was rated slightly above M=2, while commitment support was rated the highest (M = 2.28, SD = 0.91), behavioural support was close (M= 2.41, SD = 0.85), and ability support was rated the lowest (M = 2.53, SD =1.08). The respondents highly rated the usefulness of technologies and subscales of facilitating conditions.

Pearson's correlation coefficient was calculated to assess the relationship between dependent variables. The results showed a significant correlation between commitment support and ability support (r =0.58, n =65, p ‹0.001), commitment support and behaviour support (r =0.59, n =65, p ‹0.001), as well as between behaviour support and ability support (r =0.64, n =65, p ‹0.001). The Pearson correlation coefficient showed that the use of digital technology is significantly correlated with perceived usefulness r =0.67, n =65, p ‹0.001

4. Discussion

The results of the study indicate that the digital technologies introduced into the educational process for learning a foreign language and building foreign language competence made the learning process more effective. Despite the fact that digital technologies are more effective compared to traditional teaching methods, they still need to be adapted to the students' needs. According to the results of the student survey on the teachers' role in conducting classes using digital technologies, students noted that the teachers' support is very important for the information perception. Silveira and Cogo (2017) agree with the obtained results. The conducted research determined that correctly selected digital educational technologies and an optimized programme improve the development of students' critical thinking. Digital technologies are considered to be the driving force behind pedagogical innovation and the most direct influence on extending the opportunities for teachers' cognitive sustainable development (Lin et al., 2022).

Yan and Li (2023) also determined that there is a significant difference in the evaluation of cognitive abilities between respondents who used digital technologies and

those who didn't during the use of digital technologies in education. This suggests that digital educational technologies can inspire students' intrinsic desire, motivate them to learn, and improve their cognitive abilities. Vajzović et al. (2019) determined that teachers fully agree that knowledge, skills and competences acquired with the help of digital technologies are of great importance, however 1.2% of teachers do not agree with this. It is interesting that the participants in the study conducted by Vajzović et al. (2019) also indicated that they may lack some competencies related to teaching certain content using digital technologies.

This is why it is necessary to conduct further research on building teachers' readiness to help students with the use of digital technologies during foreign language learning. It is also important that teachers who have recently started using digital technologies in education should undergo certain programmes to improve their professional development (Eshonkulova, 2020). Ahmadi (2018) believes that teachers' support of a technologically integrated curriculum is of great importance for more effective presentation of educational material, which emphasizes the results we have obtained.

Fandiño et al. (2019) and Quanjiang et al. (2021) believe that motivation is the driving force in learning a foreign language. According to Kusuma et al. (2018), digital technologies enhance student motivation and are effective teaching methods (Elmurodov, 2020). We agree with the results of researchers, as the scores obtained by the EG students were higher than the scores of the students who studied using traditional methods.

The results of the study state that, despite the fact that the use of technology has a direct positive relationship with student engagement, an insignificant direct effect was found between the use of digital technologies and the level of foreign language competence.

Conclusions

The issue of learning foreign languages becomes relevant, as people's communication is not limited by the geographical borders of countries. In particular, the search for methods that allow not only to quickly and qualitatively acquire knowledge of a foreign language, but also to build the skills and abilities to use them in communication on various topics of social life. The conducted study determined the effectiveness of using digital technologies when learning foreign languages. The influence they have on building foreign language

competences is analysed. It was found that digital technologies such as multimedia, mobile applications, 3D, contribute to the positive effect on the level of basic foreign language competences. The results of the study gave grounds to state that the use of digital technologies during the study of a foreign language has a positive effect compared to the results of the control group who were trained according to the traditional programme. It was also determined that the CG students highly appreciated the usefulness of using technology and also noted that the teachers' support in the learning process is an important factor for successful learning of the material. The novelty of the research is that the research was conducted during offline learning and analysed they ways to more effectively stimulate the development of foreign language competencies through the use of digital technologies. The development of a programme using digital technologies to improve the students' communication skills in a foreign language can become a promising direction of research.

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