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Analysis of methods of teaching english as a foreign language using multimedia technologies

Análisis de métodos de enseñanza del inglés como lengua extranjera mediante tecnologías multimedia

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Abstract

This study aims to evaluate the effectiveness of multimedia technologies in teaching English as a foreign language. To achieve this, an experimental study was conducted, involving two groups of students. The control group followed a traditional methodology, while the experimental group was taught using multimedia technologies. The experiment lasted six weeks, allowing for an in-depth comparison of the learning outcomes between the two groups. The findings confirmed that multimedia tools contribute to English

language acquisition by enhancing foreign language competence, fostering creative thinking, and reinforcing professional skills. The integration of multimedia-based approaches elevates the learning process to a qualitatively new level. Interactive multimedia technologies not only enrich educational content but also enable students to learn at their own pace and support personalised instruction. The study also focuses on linguistic and pragmatic methods that influence students' academic self-efficacy. The results suggest that a mixed-methods approach supported by multimedia has a positive impact on students' confidence in their academic performance. The research highlights the necessity of improving multimedia-based programmes to enhance motivation and sociolinguistic awareness among students and teachers.

Keywords: Interactive learning, digital pedagogy, communication strategies, audiovisual support.

Resumen

Este estudio tiene como objetivo evaluar la eficacia de las tecnologías multimedia en la enseñanza del inglés como lengua extranjera. Se llevó a cabo un estudio experimental con dos grupos de estudiantes: uno de control, que siguió un enfoque tradicional, y otro experimental, que utilizó tecnologías multimedia. La duración del experimento fue de seis semanas, lo que permitió comparar los resultados de aprendizaje de ambos grupos. Los hallazgos confirmaron que el uso de herramientas multimedia mejora la competencia en lenguas extranjeras, fomenta el pensamiento creativo y fortalece las habilidades profesionales. La integración de enfoques multimedia eleva el aprendizaje a un nivel superior. Las tecnologías interactivas enriquecen los contenidos educativos, facilitan el aprendizaje autónomo y promueven la instrucción personalizada. Además, el estudio analiza métodos lingüísticos y pragmáticos que influyen en la autoeficacia académica. Los resultados indican que un enfoque de métodos mixtos respaldado por multimedia tiene un efecto positivo en la confianza de los estudiantes en su desempeño. Finalmente, la investigación resalta la importancia de mejorar los programas educativos basados en multimedia para optimizar la motivación y la conciencia sociolingüística de estudiantes y profesores, contribuyendo así a la innovación en la enseñanza del inglés como lengua extranjera.

Palabras clave: Aprendizaje interactivo, pedagogía digital, estrategias de comunicación, apoyo audiovisual.

Introduction

Trends in the new education system of Ukraine define the priority ways of developing education by introducing modern information technologies in the educational process. Transformations in Ukrainian education require a deep restructuring of pedagogical and psychological science by the new realities of modern life (Turchyn et al., 2023). The latest technologies are penetrating deeper into all spheres of human activity; therefore, at the present stage, the informatisation of education is considered a system of processes aimed at meeting the educational, information, computing and telecommunication needs of participants in the educational process (Morozova et al., 2021). In this aspect, multimedia technologies such as interactive platforms, video tutorials, mobile apps and virtual reality create a dynamic learning environment for students. For foreign language learners, integrating multimedia into the curriculum helps to develop all language skills (Xu et al., 2021). Thanks to the capabilities of multimedia technologies, listening, speaking, reading and writing skills are improved. Teachers who implement them in their work ensure individualisation of the learning process and increase student motivation.

Accordingly, the proposed study aims to evaluate the effectiveness of using multimedia technologies in teaching English. The aim of the study guided the following research questions:

1. How does integrating multimedia technologies affect students' progress in learning English?
2. What multimedia tools can be identified as the most effective in acquiring language skills?
3. How do multimedia technologies model student motivation?

The scientific novelty of the study lies in analysing the effectiveness of multimedia technologies in teaching English, taking into account modern educational trends. Also, the novelty and expediency of this work lie in the comprehensive approach to assessing the effectiveness of multimedia. The analysis is made possible by analysing the impact on student's motivation and engagement in the learning process.

The paper is aimed at considering new methods of teaching English and their limitations. A separate issue is the analysis of the implementation of multimedia technologies in new methods of teaching foreign languages. The proposed experimental study's results should help objectively evaluate the effectiveness of multimedia teaching compared to traditional methods and develop recommendations for the use of multimedia technologies in teaching English.

Thus, the purpose of the article is to consider the introduction of multimedia technologies into new methods of teaching foreign languages. The results of the work will be helpful in developing recommendations for the use of multimedia technologies in teaching English. The work follows a logical sequence of structure, which includes a literature review, research methodology, analysis of experimental results and practical recommendations based on the data obtained.

Theoretical Framework or Literature Review

Related research in the field of didactics shows that multimedia technologies are extremely effective for teaching foreign languages. Using interactive platforms, mobile applications, virtual simulations, video tutorials, and artificial intelligence systems, teachers can adapt learning to the needs of each student. Vedadi et al. (2019) emphasise the effectiveness of multimedia learning through the integration of visual and auditory components in English language learning. They contribute to the effective memorisation of the material. In another related study, the authors argue that the use of virtual and augmented reality significantly motivates students by immersing them in a realistic language environment (Abdulrahaman et al., 2020). It should also be noted that all new technologies do not replace traditional teaching methods. Rather, they increase their effectiveness. Therefore, the authors do not argue about the relevance of communicative, blended and project-based approaches. According to scientists, new technologies are the most effective today for learning a foreign language. In their work, Isakova et al. (2020) investigated the impact of blended learning and the communicative method in Ukrainian secondary schools. The authors used a mixed method. It included student surveys and pre-/post-study language competency assessments. Of course, the results demonstrated increased student motivation and participation. However, the study lacked longitudinal data. Therefore, it did not isolate the specific contribution of individual digital tools to language learning outcomes.

López Córdova (2024), using a case study design focused on language immersion in a digital environment, argues that natural language acquisition is facilitated by the constant exposure to English media and real-time communication applications. Although the article emphasizes strong student involvement and autonomy, it is limited by the small sample size. This reduces the generalizability of the results. Despite the sufficient evidence on the effectiveness of integrating multimedia in foreign language education, the results of these works remain inconsistent, such as studies that identify gamified platforms such as Duolingo, Kahoot and Quizlet. They are effective in increasing personalization and motivation (López Córdova, 2024). Although other authors warn against over-reliance on technology. Lee & Xiong (2022), point out the risks of distraction, cognitive overload and anxiety of students. The author emphasizes the importance of teacher mediation and pedagogical coherence when implementing digital tools. A particularly controversial topic is the use of artificial intelligence in learning. Huang et al. (2023) insist on its potential for hyper-personalization and adaptive learning pathways. While, Li (2019) writes about the reduction of opportunities for live interpersonal communication. The author argues that the use of artificial intelligence should be balanced with human interaction and teacher supervision.

Thus, such a diverse perspective highlights a critical gap in the existing literature. Although many studies focus on short-term benefits or isolated technologies, there is still a lack of holistic, comparative analysis

of multiple multimedia tools in real classroom settings. The proposed work aims to address this gap. The paper evaluates the effectiveness of a multimodal approach. Therefore, by comparing multiple digital platforms within a single pedagogical framework, it is possible to provide empirical evidence of the positive impact on student motivation and long-term language competence of combining traditional methods with adaptive multimedia tools.

Methodology

This study uses an experimental research method to examine aspects related to English language learning by integrating multimedia devices into modern teaching methods. Linguistic and pedagogical research methods were used to identify the most effective methodology for this experiment. This mixed methodology made it possible to use complementary research methods, which are shown in Table 1:

Table 1.
Research strategy

The research stage	Type of research	The aim of the study	Research tools	Participants of the study	Data analysis methods
1	Qualitative research	To understand the linguistic implications of multimedia For compiling and linking methods, pedagogical means of improving the level of motivation among students	Initial testing	5 English teachers from at least 10 years of experience	Comparative analysis of average scores
2	Quantitative research	To measure the effectiveness of multimedia programmes for level up motivation and haste	Surveys	120 participants (60 students per group) Control group: 60 participants. The experimental group: 60	Statistical analysis
3	Qualitative research	For a better understanding of multimedia applications students. To identify research gaps.	Observations.	Experimental group: 60 students Control group: 60 students	Content analysis

Source: authors' own development.

For this study, we relied on an experimental design. This allowed us to determine the impact of multimedia technologies on the quality of English language learning among the experimental group. This research type was chosen because it can establish cause-and-effect relationships between teaching methods and learning outcomes.

For the experiment, 120 participants were selected: two groups of students. The CG (60 students) studied English using the traditional methodology (lectures, self-study and standardised test tasks).

The EG (60 students) taught English using multimedia technologies (interactive platforms (Kahoot, Quizlet), video lessons, VR simulations and gamified tasks).

The experiment lasted 6 weeks.

The selected participants were divided into three levels of English: beginner, intermediate and advanced. The groups were formed randomly. This helped to avoid bias in the results.

The methods used to collect data included pre- and post-experiment testing, student questionnaires, and observation.

In the first stage, students took an English language test. Then, they were asked about their motivation, satisfaction with the learning process and level of engagement. Finally, the students' interaction with multimedia resources and engagement in learning were analysed.

The data were analysed using a comparative analysis of pre-and post-experiment scores for both groups, statistical analysis based on t-test and analysis of variance (ANOVA) to check the significance of changes, and content analysis of the survey. This allowed us to identify qualitative changes in students' motivation, satisfaction and engagement.

All the methods described above were used to determine the effectiveness of multimedia technologies in teaching English to students.

All instruments used in the study (English language tests, surveys and observation protocols) were peer-reviewed. The recommendations of the Common European Framework of Reference for Languages (CEFR) were followed. Regarding content validity, all language proficiency tests were adapted and validated by three experienced English teachers. Cronbach's alpha was used for the internal consistency of the motivation and engagement survey. The reliability score was 0.87. This indicates a high reliability of the results, which in turn were improved based on interrater agreement, with a Cohen's kappa of 0.82.

Group allocation was performed to control for researcher and teacher bias. Allocation was randomized. It was performed using a computer-generated randomization sequence. All teachers involved were not informed about the specific hypotheses of the study. Their interaction with students was monitored. This was to ensure consistency in the work carried out in different groups. The data was coded. To reduce subjective interpretation and to improve quality, the responses were anonymized.

Using thematic analysis, the content of the responses to the open-ended questionnaires was analyzed and observation notes were taken according to the six-phase model of Braun & Clark (2006). It included familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and compiling a report. This approach allowed us to identify key recurring patterns in the students' perception of multimedia use.

Reproducibility is presented in (English language proficiency test, full questionnaire on motivation and engagement, observation rubric used to assess engagement in classes and interaction with multimedia tools).

The proposed study is formally approved by the Institutional Review Board (IRB) of the affiliated university, and all participants provided informed consent for voluntary participation and the right to withdraw from participation at any stage. The work is completely confidential.

Results and Discussion

Modern methods of learning a foreign language (let us call them traditional since the theoretical model has been used for a long time without integrating the latest technologies) are based on authoritarian approaches. The teacher is the primary source of information and knowledge, while students passively absorb information. Therefore, we can immediately reject the grammar-translation, audiolinguistic, and direct teaching methods. These outdated methods no longer correlate with the needs of modern students. To confirm this opinion, we can highlight the shortcomings of traditional methods (Fig. 1):

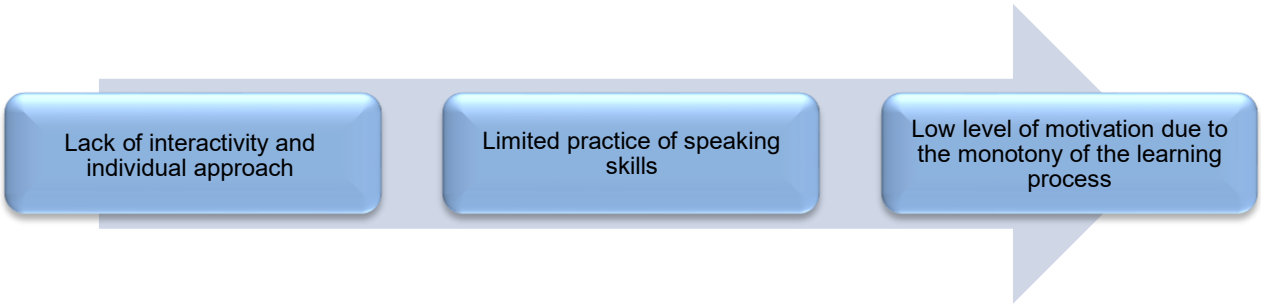

Figure 1. Problematic nature of sustainable approaches in the light of new technologies.
Source: authors' own development.

Accordingly, there is a need to find new approaches to engage students more actively in learning English. To increase students' engagement and motivation in learning English, we used multimedia technologies with a wide range of tools (Table 2):

Table 2.
Stages and types of multimedia technologies used

View	Opportunity
Interactive platforms - Duolingo, Quizlet, Kahoot	To enable self-study and repetition of the material
Video tutorials and learning videos - TED Talks, BBC Learning English	To develop listening and pronunciation skills
Virtual and augmented reality - headsets	To create immersion in the language environment, to promote better learning.
Mobile applications	For learning at any time, increasing the accessibility of the material.
Gamification	To use game mechanics to increase student motivation and engagement.

Source: Achkan, Vlasenko, Rovenska, Sitak & Chumak (2022)

Targeted multimedia technologies were supposed to improve the knowledge of the experimental group by enhancing interaction between students and teachers, promoting independence in learning, and providing a personalised approach to learning.

The study evaluated the effectiveness of multimedia technologies after the experimental study. CG studied using traditional methods, EG - using modern methods, using multimedia technologies for 3 months. The evaluation of effectiveness based on performance testing, questionnaires on the level of motivation and analysis of students' involvement in the learning process are presented below (Table 3):

Table 3.
Mean score of CG and EG before and after the test

Group	Grade point average (before)	Average score (after)	Improvement (%)
CG	62,4	68,1	9,1%
EG	61,8	75,3	21,8%

Source: Authors' own research.

Thus, the t-test shows an improvement in the experimental group. The improvement in learning outcomes is statistically significant ($p < 0.05$).

- The students in the experimental group showed significantly better results in listening (+20%) and speaking (+15%) tests.
- The level of motivation in the experimental group increased by 30% compared to the control group.

– Most students positively assessed the use of multimedia resources and noted that learning had become more interesting and understandable.

The next stage of the survey on student motivation showed the following results (Table 4):

Table 4.
Increased motivation according to the survey results

Indicator	CG%	EG%
High motivation	54,2%	78,5%
Recognised methods as effective	60,3%	85,6%
They found learning more interesting	52,1%	80,4%
We noticed better interaction	47,6%	82,9%

Source: Authors' own research.

According to the content analysis of students' open-ended responses, multimedia technologies contribute to better learning and increase motivation to learn English. In the third stage of the experiment, the teachers provided information about their observations of the learning process. According to the analysis of students' interaction with multimedia technologies, EG participants actively interacted with the material and used independent information search more often. The attention and concentration of the EG participants were higher than those of the CG.

Accordingly, the overall improvement in results is shown in (Fig. 2):

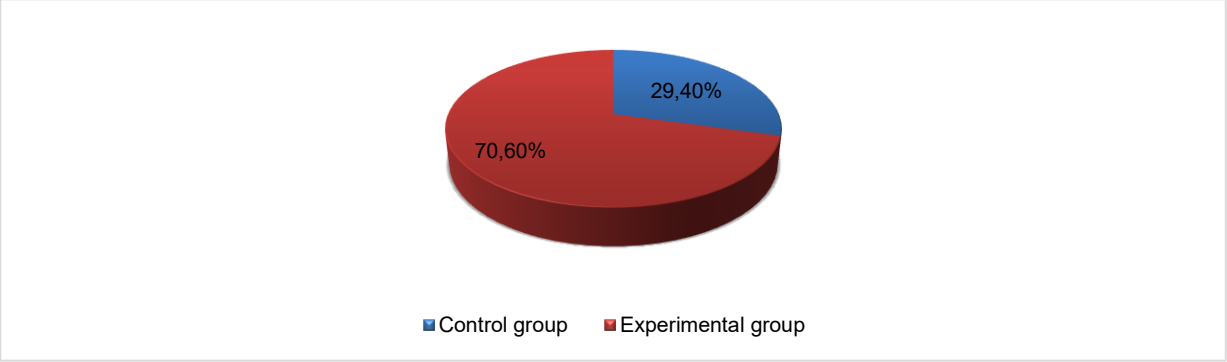

Figure 2. Level of knowledge after the experiment.
Source: Authors' own research.

Accordingly, in the CG, there is an increase (+9.1%), in the EG - (+21.8%)

The results demonstrate that multimedia technologies are practical tools for teaching English, improving students' performance, increasing motivation and creating an interactive learning environment. Multimedia adapts learning to the needs of modern students. Integrating multimedia technologies into English language teaching methods makes learning more effective and engaging.

The use of multimedia technologies remains very diverse, as the new technologies themselves represent a multiplicity of different tools and means. Yemelyanova et al. (2022) speak of multimedia as an extremely heterogeneous construct that can cover the aspect of images, databases, encyclopedias, learning environments, and which can be related to such different fields as psychology, education, pedagogy. Thus, it can be argued that multimedia technologies have a complex and diverse impact on all areas.

The first working question focused on the relationship and impact of multimedia technologies on education, especially in English language learning. In this context, Yuhan et al. (2024) emphasise that in order to

understand the effectiveness of multimedia, it is first necessary to determine how multimedia technologies can be used in relation to foreign language learning and teaching.

Afrilyasanti et al. (2022) describe the historical relationship between language and computer science. The authors note that the first works that put computer languages at the service of computer science languages coincide with the emergence of computer science itself. Subsequently, from the seventies to the present day, there has been a constant interaction between new technologies and education (Alenezi, 2023).

Thus, the results of the proposed study revealed a statistically significant improvement in language acquisition and motivation of students in the experimental group that used multimedia technologies. Such data are consistent with the results of Yuhan et al. (2024). The authors emphasize the increase in student engagement due to interactive video content. However, their study focused mainly on vocabulary memorization. While in the proposed study, significant improvements were observed in all four language skills (speaking, listening, reading, writing). This indicates the advantages of a multimodal approach.

Orsoni (2024) nevertheless expresses concern about the use of multimedia. The author insists on the reduction of critical thinking due to the excessive use of gamification. Of course, our results showed an increase in motivation during gamified classes. However, it also turned out that students in the experimental group demonstrated stronger independent task completion by the fifth week of the program. This could be due to the structured integration of reflective components (written summaries after completing the task). Thus, there is evidence that the design and context of multimedia integration are key to the effectiveness of language learning.

Nicolaou et al. (2019) talk about the importance of adaptive learning platforms. They are indispensable for adapting content to individual needs. The authors emphasize the variability of effectiveness depending on the initial level of language proficiency of students. The proposed work included participants at beginner, intermediate and advanced levels. However, no statistically significant differences in improving performance between levels in the work were found. Therefore, it can be argued that although adaptive platforms can improve personalization, there are other factors for improvement. Particularly important are teacher support and content quality. They are the ones that mitigate their overall impact.

Although the findings of the relevant works confirm previous studies, our work offers new depths. The results show the effective impact of multimedia tools on motivation and performance. Learner autonomy and sustained engagement over time are also at stake. The results of the proposed work highlight a gap in previous research. They tend to focus on short-term effects, while omitting long-term integration into pedagogical practice.

This interaction eventually moved logically into the field of foreign language learning. Pham (2025) explains this strong connection from two perspectives - sociological and didactic. In this context, Devadze & Gechbaia (2024) say that modern language learning is one of the areas where technological tools are used the most and the earliest. Alrikabi et al. (2022) explain this by both the exponential growth of social demand for language learning and a certain tradition of self-education in this area. Today, behaviourist methods, which some scholars have interpreted as outdated have adapted well to language applications (Belda-Medina & Calvo-Ferrer, 2022).

The position of some scholars on the use of multimedia technologies for learning foreign languages is interesting. In his classification, Orsoni (2024) identifies three ways of using them: free use of technology, without being a carrier of any didactics, the user must program his or her learning (for example, working in Microsoft Office), the use of less specific software that performs a specific didactic and pedagogical role (for example, gamification), and the use of artificial intelligence products. These uses demonstrate how the relationship between technology and language learning in general can be productive. If we transfer the general practices to the specific area of English language learning, it would be wise to approach the issue in light of pedagogical trends that encourage or discourage the use of multimedia to varying degrees.

In the context of the second working question on motivation, it should be noted that motivation plays a key role in foreign language learning.

Modern language learning methods, such as the audio-oral method, are fully adapted to the use of multimedia. Nicolaou et al. (2019) write that language is conceived as a network of syntactic structures that need to be learnt in the form of automatisms. In this sense, multimedia technologies have an identical principle. Their use can only bring positive benefits, as it is the par excellence tool for introducing language automatisms (Sherman et al. 2022; Saienko, 2023). The same can be said about the structural-global method for learning foreign languages. Its conception of language as a global and structured form that has to be learned in its entirety without fragmentation can also be effectively combined with multimedia tools (Puebla et al., 2022). Through audiovisualisation and subtitling, Multimedia may well present the language as an organised whole (Mkrttchian et al., 2019).

Thus, traditional methods of foreign language learning are readily aligned with the use of new technologies (Jie & Sunze, 2023). Paradoxically, the most outdated teaching methods, which are less likely to use new technologies as direct teaching tools, can be combined with multimedia devices (Ikwuka et al., 2024). The communicative approach and activity-based approach, for example, make multimedia an ideal tool for traditional learning (Kharroubi & ElMediouni, 2024). Legemaate et al. (2022) argue that language is primarily a communicative skill and relegates purely linguistic and syntactic competence to the background. Thus, it is up to the teacher to assess the need to use multimedia in a given situation. Martín-Sómer et al. (2024) write that the use of multimedia has already become a teaching tool, and it is by far the most common use in the field of foreign language learning to increase student motivation and engagement.

New technologies have developed so rapidly that it is the way of understanding these technologies that are poised to democratise new education (Iyamuremye et al., 2022). Any person today can work with technology with more or less initiation thanks to pre-programmed software, unlike older programs that require knowledge of a specific computer language. Nevertheless, technical training of teachers is important for language learning and didactics, as it covers deeper processes of methodology and technology (Damayanto et al., 2022).

It is up to the teacher to choose the methodology and implement multimedia technologies to support it. These tools offer the teacher tools designed for teaching and, in particular, for in-depth analysis of student performance, motivation and engagement (Garvasiuk & Namestiuk, 2022; Kokkonen et al., 2022).

In the context of technological advances in foreign language teaching and learning, there is a tendency towards the radical trivialisation of the Internet, which ultimately leads to a variety of technological applications for teaching and learning foreign languages. Both teachers and students are faced with constant change and a multiplicity of new technologies (Griffin et al., 2024). The variety of ways in which new technologies are used eludes analysis of their effectiveness. Faced with this wave of technology in the field of foreign language learning, we should not forget that learning a foreign language solely through multimedia in isolation from a specific methodology is unthinkable.

Therefore, the results of the study indicate the effectiveness of multimedia technologies in increasing students' motivation and success in learning English. These results are consistent with many studies. However, there are still cases of overload among elementary students. These cases partially confirm the warnings of Han & Yin (2023) regarding the excessive cognitive complexity of VR environments. For the successful integration of multimedia, the qualifications of teachers and the adaptation of content to the level of students turned out to be an important factor. Although the topic is fully disclosed, this study has limitations. First of all, it is about the limited sample and the short duration of the experiment. The results of the proposed work emphasized the feasibility and effectiveness of using multimedia tools within the framework of blended learning. Therefore, further research is needed to assess their long-term effect.

Conclusions

The results of the study prove that the integration of multimedia tools has a significant impact on increasing students' motivation. The tools improve the development of foreign language competence, thus improving the quality and content of education.

The data obtained after the experiment showed that students who studied using multimedia technologies showed higher test scores. In addition, they were more engaged in the learning process than the control group. Therefore, integrating multimedia such as interactive platforms, video tutorials, mobile applications and virtual reality can contribute to deeper learning. The development of language skills, including listening, reading, writing and speaking, has improved significantly.

The study emphasises the need for an effective combination of traditional and multimedia methods of teaching English. This combination creates an adaptive learning environment. Classical pedagogical strategies and the integration of multimedia technologies motivate and engage students in learning English. Despite the new opportunities for improving the quality of English language teaching, the use of multimedia interactive technologies requires the improvement of educational programmes. This will be an important step in modernising the foreign language teaching system.

Thus, the study's results demonstrate the effectiveness of using multimedia technologies in teaching English. Students' performance improved significantly, and the experimental group members became more motivated and spoke about the comfortable educational environment. However, we should not forget the need to train teachers to achieve maximum implementation of multimedia in the learning process.

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