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Developing Language Skills and Intercultural Competence of Primary School Students in the Context of Digital Convergence

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Abstract The study presents the use of digital educational technologies (DET) with a special focus on the integration of the Nearpod platform in the context of improving the language skills and intercultural competence of primary school students. The main objective of this study is to determine the productivity of the dialogic digital environment in developing language skills and intercultural communication in the foreign language educational environment of primary school students. The experiment was conducted with a total of 287 respondents divided into experimental and control groups. Participants of the experimental group were taught using Nearpod, while participants in the control group continued to study using the traditional teaching method. Analysis of the extracted data showed that students in the experimental group achieved the highest level of improvement in both language skills and intercultural competence compared to the respondents in the control group. Based on the data, DET, mainly the Nearpod platform, has high potential as a teaching tool for intercultural competence and language skills in primary education.

Keywords: *Foreign language education, Language skills, Intercultural communication, Digital educational resources, Digital literacy*

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1. Introduction

In the context of digital convergence, foreign language education is rapidly transforming, integrating digital approaches and innovations. Digital educational technologies (DET) are becoming an integral part of the pedagogical process, contributing to the formation of key competencies of the 21st century, such as creativity, critical thinking, collaboration, and communication (Mishra & Koehler, 2006; Voogt et al., 2015). Modern schools are faced with the need not only to master the language but also to develop intercultural competence, which is due to global changes in the social and professional environment (Redecker & Punie, 2017). Immersion in a foreign language environment requires students not only to be linguistically literate but also to be able to perceive cultural differences and show empathy and tolerance, which is becoming an important element of successful socialization (Pishghadam et al., 2023).

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Recent research highlights the importance of digital platforms in language teaching, especially in terms of expanding students' communicative capabilities in a globalized world (Wang, 2021). One of the productive platforms that promotes the improvement of intercultural and linguistic skills is Nearpod. Nearpod is a digital tool with a wide range of multimodal features, which includes videos, interactive whiteboards, virtual reality elements, and built-in feedback forms (Alghamdi, 2022). Based on the above-mentioned capabilities, Nearpod enables teachers to tailor teaching to the individual needs of students, improve their interest, and maintain sustainable motivation. The achieved research results served as evidence that the use of interactive platforms such as Nearpod promotes more thorough learning through personalization of learning and the implementation of a multimodal approach (Alghamdi, 2022; Wang, 2021). Multimedia tools enable students to analyze language structure, cultivate intercultural context, and build cognitive strategies within the framework of more productive communication (Korosidou & Griva, 2024). This process is especially relevant in primary school, where the fundamental foundations of both speech and intercultural competence are formed. It should be noted that in the innovative world, direct contact with foreign languages and the ability to perceive sociocultural competencies are becoming integral parts of successful professional and social development (Redecker & Puni, 2017). At the same time, language as a phenomenon is experiencing a stage of mobile development, within which its structure and content are in constant transformation. These changes are driven by a combination of factors, including political and technological progress, which can have both positive and negative effects on intercultural interaction processes. These structural transformations confirm recent linguistic studies in the Kazakh and English languages (Toluspayeva, Shubina et al., 2024; Toluspayeva, Shukan et al., 2024).

Despite the growing interest in this topic and the positive effects recorded in individual cases of using digital solutions, there remains a lack of empirical research aimed at identifying the systemic impact of digital learning technologies on language literacy and intercultural skills of primary school students, the age category in which the cognitive foundations of perceiving a foreign language environment are laid (Derich et al., 2025; Korosidou & Griva, 2024). To choose the optimal strategy of pedagogical influence, it is necessary to understand the capabilities of various digital tools, such as:

– Kahoot!, Nearpod – for interactive presentations and tests;
– Jamboard, Padlet –for collaborative work and virtual boards;
– Genially, Quizlet –for forming projects and multimedia game methods.

The resources presented above open the door to reaching new horizons in the framework of joint learning and cultural exchange. Modern technologies contribute to the improvement of not only language skills, but also an accepting attitude towards cultural diversity, empathy, and interpersonal communication skills, valuable in the context of globalization (Pishghadam et al., 2023; Sung et al., 2016). Thus, there is an increasing need to adapt educational models that take into account the cognitive and emotional characteristics inherent in primary school students in order to form an inclusive and developing digital environment. The purpose of this study is to examine the impact of DET, especially the Nearpod platform, on the development of foreign language competence and intercultural communication of primary school students. In addition to identifying the main factors that contribute to the effective use of digital technologies in the educational environment, this study formulates recommendations for leading teachers on their integration. The identified results will be valuable not only for teachers but also for those who aim at forming inclusive, adaptive, and sustainable digital platforms.

2. Theoretical Framework

Innovative educational technologies improve the educational process and contribute to the evolution of not only language skills but also intercultural communication skills (Blake, 2013; Hampel & Stickler, 2015). These changes are associated with the introduction of DET, which forms personalized and interactive learning conditions (Redecker & Punie, 2017). Based on this, it can be noted that DET offers us innovative approaches to learning, which include the collaboration of multimedia resources, interactive developments, and adaptive learning. The use of digital technologies makes it possible to improve the implementation of the educational process, increase student motivation, and create a

significantly inclusive educational environment. The theoretical basis of the presented article is sociocultural, cognitive, and constructivist learning models; in essence, each of them pays special attention to some aspects of DET in the practice of educational activities. Certainly, these approaches open up prospects for contemplating issues of implementing innovative technologies in order to improve students' academic performance and their social communication.

2.1. DET in Language Learning: Challenges and Limits

DET provides a wide range of language learning opportunities, including multimedia resources, interactive platforms, and adaptive tasks. In a study, Mayer (2022) emphasizes that multimodal delivery of information contributes to favorable assimilation of material, which activates auditory, visual, and kinesthetic means of perception. As an example, the use of interactive presentations and video lessons allows learners to simultaneously perceive audio, text, and visual information, which improves their ability to memorize and analyze the material provided. This approach allows us to attribute it to the cognitive model of learning, which assumes that the information received is more likely to be remembered when presented in a variety of formats. Previous studies provide support that digital platforms such as Nearpod promote student engagement and motivation (Alghamdi, 2022; Wang, 2021). The technologies presented by the authors open up broad opportunities for the formation of individual learning trajectories adapted to the level of preparation and needs of students. This process reflects a constructive approach, according to which knowledge is formed on the basis of joint and individual activities of students. It should be noted that the integration of digital technologies contributes to the development of students' self-actualization skills, which is an integral part in the context of learning a foreign language (Sarzhanova et al., 2023). Of course, considerable attention is paid to the evolution of intercultural competence through the introduction of digital technologies. Chen et al. (2019) directly confirm that distance learning and forums provide an opportunity to explore cultural differences through discussions and dialogues with native speakers of a foreign language, which is substantiated within the framework of sociocultural learning theory. In addition, Nearpod, as one of the leading platforms, includes culturally relevant materials and tasks that stimulate students to analyze and perceive cultural differences. This process plays a particularly important role in the context of global convergence, where the perception of cultural differences is becoming one of the core competencies.

Despite all the advantages, the introduction of digital technologies into the educational process is associated with a number of difficulties. One of the main issues discussed is the lack of technical resources and highly qualified personnel, especially in remote areas such as towns, urban-type settlements, and districts (Sung et al. 2016). As an example, we can note that some educational institutions do not have a stable Internet connection and innovative digital equipment, which limits their ability to use DET. It is confirmed that this aspect is especially relevant in developing countries where there is a digital divide. In addition, according to the research conducted by Golonka et al. (2014), teachers face certain difficulties in implementing educational materials in accordance with the needs of the digital environment. It is obvious that many leading teachers do not have relevant experience working with digital educational platforms, which ultimately leads to the ineffectiveness of their use. Based on the above, the emergence of a need for developing advanced training courses aimed at training teachers to use digital tools in the educational process is confirmed. There is also a renewed need to address differences in students' access to the Internet and digital technologies. Although this hypothesis seems obvious, according to the study by Sung et al. (2016), the digital divide may pose additional barriers to successful digital integration. These barriers are particularly noticeable in schools and educational institutions with limited resources, where students have limited access to laptops or tablets. In order to overcome the above limitations, we propose conducting comprehensive professional development courses for teachers.

2.2. Impact of Interactive Resources on Foreign Language Learning

Interactive educational resources in the form of Nearpod create an environment that promotes the improvement of basic language skills such as listening, reading, speaking, and writing. According to Sarzhanova et al. (2024), interactive tasks enable students to thoroughly understand the educational material, simultaneously developing analytical skills and critical thinking skills. As an example, we

can note the implementation of interactive quizzes and videos that help students thoroughly understand the structure of the language and also memorize grammar rules. Such tasks provide an opportunity to practice the material covered in a variety of contexts that promote its deeper assimilation.

Moreover, in their work, Lin et al. (2023) pay special attention to the importance of team projects within the digital educational environment, stimulating team resolutions of tasks and improving communication skills. For example, the Nearpod platform has tasks that include forming team projects, solving communication problems, and exploring cultural scenarios, which help students not only improve their language skills but also adapt to cultural differences. As a result, students not only learn the language but also learn teamwork, which is an important skill in today's innovative world. Moreover, interactive resources help improve student engagement in the educational process.

Interactive resources also help increase student interest in the educational process. According to research by Sung et al. (2016), actively participating students who vigorously use digital tools show significantly higher motivation for educational activities and a higher perception of the material covered. Some types of interactive tasks, such as games, quizzes, and virtual discussions, make the educational process fun and productive, which is especially important for primary school students.

2.3. Digital Technologies as a Means of Developing Intercultural Competence in Primary Schools

Intercultural competence (ICC) is revealed through cognitive, affective, and behavioral components, including cultural awareness, empathy, and behavioral flexibility (Deardorff, 2009). The introduction of digital tools, such as platforms for telecollaboration and digital storytelling, creates an educational environment that promotes the development of these components. For example, COIL projects and virtual exchange allow students to go beyond the local cultural context and interact with foreign peers, which promotes conscious perception of cultural diversity (Guth & Helm, 2010; Mevel et al., 2020; O'Dowd, 2006).

Digital storytelling is actively used as a tool for meaningful cultural expression. In the study by Szende et al. (2023), students participated in collective digital storytelling projects, creating multimodal stories that shaped and reflected their cultural identities; such projects stimulated the growth of ICC through personal narratives and visual means (personal narratives, reflective audio, and visual storytelling). Furthermore, in the context of digital storytelling and inclusion (Szende et al., 2023), the use of digital storytelling in a mixed-sex classroom led to increased inclusion and communicative competence of students from migrant backgrounds, with improvements in both language and narrative skills. Sociocultural and constructivist approaches emphasize the importance of interaction in the educational environment: students learn through dialogue, sharing experiences, discussing cultural differences, and creating joint products. Such conditions develop ICC through active engagement in project-based activities (Belz & Müller-Hartmann, 2003; Ligorio & van Veen, 2006; Sung et al., 2016). CSCL (computer-supported collaborative learning) provides platforms for developing flexible thinking, negotiation strategies, and critical cultural understanding – even in the absence of face-to-face contact, students learn to perceive cultural differences as a resource rather than a barrier. Digital platforms such as Nearpod provide the opportunity to integrate culturally relevant content, interactive activities, and multimedia into the learning process. A study by Allawiyah and Ahmadi (2024) in an Indonesian primary school found that Nearpod helped create a valid and practical media course on Indonesian cultural diversity, which increased engagement and cultural understanding among students. Recent research supports Nearpod's effectiveness in improving student engagement (Alghamdi, 2022).

However, the effectiveness of ICC initiatives through DET depends on the technical infrastructure and teacher training. Research shows that the lack of a stable internet connection, insufficient teacher competence, and students' digital divide reduce the potential of ICC projects (Sung et al., 2016). For example, studies in Greece and the Philippines note that teachers need to be trained in the design of digital storytelling and CSCL collaborative activities so that they can effectively integrate technology in a culturally inclusive manner (e.g., Greek DST research, 2022).

It is recommended to include activities such as digital storytelling, virtual CSCL projects, and interactive Nearpod assignments in the curriculum that are tailored to the students' cultural context.

Their systematic implementation should be combined with teacher training, methodological recommendations, and joint planning – to ensure cultural sensitivity and technical literacy. Such integration creates conditions for the development of ICC in primary school students, facilitating their successful socialization in the digital global space.

3. Methodology

3.1. Theoretical Basis

The theoretical basis of this study was implemented within the framework of a pedagogical experiment in the following way:

- The cognitive approach was used when using multimedia materials such as infographics, video, and audio, which were posted on the Nearpod platform, aimed at activating various means of perception.
- The sociocultural approach was reflected in the formation of virtual group assignments and discussions, which aimed at improving intercultural communication between students.
- The constructivist approach was implemented within the framework of a project assignment, in which students, individually or in groups, formed educational products that contributed to the formation of skills of linguistic autonomy and critical thinking.

3.2. Participants

This study involved 287 primary school students aged 7–9 years from two different educational institutions. Of the 287 participants in the experiment, 144 students were assigned to the experimental group, and the remaining 143 students were assigned to the control group. In the context of the selection of participants, a stratified random sample was used, according to which the participants were distributed into groups, taking into account previously established parameters: the level of initial language training, age category, and training in a multilingual educational environment. This approach makes it possible to ensure a balance in the conduct of the experiment of various groups and to increase the accuracy of the study between the experimental and control methods.

3.3. Instruments

The following instruments were used to assess language skills and intercultural competence in English:

3.3.1. Cambridge English Young Learners (YLE) – Movers test

To determine the level of language skills (listening, reading, writing, and speaking), the Cambridge English Young Learners (YLE) – Movers test, which was developed by the University of Cambridge, was used. This test fully corresponds to the Pre-A1 level of the Common European Framework of Reference for Languages (CEFR) and is a valid tool for assessing the language competence of primary school students (7–9 years old).

The fundamental components of the test included:

- ***Reading:*** tasks for understanding the text, which include various answer choices, establishing the main idea, and analyzing details.
- ***Writing:*** tasks with an emphasis on the structure of the text, grammatical clarity, and accuracy of presentation.
- ***Listening:*** exercises for understanding audio materials, which include determining the main idea and identifying accents.
- ***Speaking:*** tasks for developing oral speech, which include periphrastic monologues, involvement in dialogues, calculating speed, clarity of pronunciation, and the use of vocabulary.

3.2.2. The Intercultural Sensitivity Scale (ISS) Questionnaire

To assess the level of intercultural competence, an adapted version of the Intercultural Sensitivity Scale (ISS) questionnaire developed by Chen and Starosta (2000) was used. The questionnaire was

developed taking into account the age characteristics of younger school children (7–9 years old), including reformulating the statements in a more accessible form corresponding to the cognitive level of children.

The questionnaire construct includes 5 subscales: Interaction Engagement – 7 items, Respect for Cultural Differences – 6 items, Interaction Confidence – 5 items, Interaction Enjoyment – 3 items, and Interaction Attentiveness – 3 items. The total number of items in the original scale is 24 statements, measured on a 5-point Likert scale (from "completely disagree" to "completely agree"). The original Cronbach's α reliability coefficient for the subscales ranges from 0.70 to 0.86. Construct and content validity of the questionnaire have been confirmed in international studies (Chen & Starosta, 2000).

To ensure that the scale fits the age range of 7-9 year-old students, the Intercultural Sensitivity Scale was adapted: the statements were reformulated in a simplified form, the vocabulary was adapted to the cognitive abilities of younger students, and visual elements (emoji, pictograms) were used instead of the standard Likert numerical scale to ensure task certainty. After each stage of adaptation, a repeated expert content validity check was conducted with the involvement of specialists in the field of pedagogy and child psychology. This procedure allowed preserving the main psychometric characteristics of the original scale and ensuring the reliability of data collection within the age sample. The overall indicator $\alpha = 0.86$ indicates high internal consistency and ensures its applicability in replication (Chen & Starosta, 2000).

3.2.3. Observation

In addition to tests and questionnaires, observation was conducted, during which teachers and researchers recorded behavioral manifestations of language activity and readiness for intercultural interaction: participation in dialogues, reaction to cultural elements of tasks, level of involvement, and emotional response. The data were recorded in pedagogical observation cards compiled according to a scale with descriptive indicators.

3.3. Procedure

3.3.1. Data Collection

The study was conducted over the course of one academic semester (4 months) and included three key stages: pre-testing, learning process, and post-testing. In the first stage, participants in both groups underwent preliminary diagnostics, including the standardized Cambridge English YLE Movers language test and the ISS. This allowed us to record the initial level of language skills and intercultural competence.

In the second stage, over the course of 12 weeks, the experimental group was taught using the Nearpod platform. Lessons were based on the principle of an interactive and multimodal approach: the teacher uploaded materials to Nearpod in advance (texts, audio, grammar and vocabulary assignments, videos, virtual excursions, and surveys), and students connected via tablets or laptops. Each lesson included alternating theoretical blocks (presentations, video introductions) and interactive exercises (tests, matching assignments, listening with visual support, pair work via the Collaborate Board). During the work, the answers, time of completion, and level of involvement were recorded. All sessions were accompanied by feedback from the teacher, and the results were saved in the system, which allowed tracking of the dynamics.

At the same time, the control group was taught using the traditional method. Classes included work from the textbook, oral exercises, written assignments, frontal surveys, and dictations. The use of digital tools was minimized (mainly the use of audio discs and printed exercises), which allowed for maintaining the purity of the experiment.

The third stage included re-testing using the same tools (YLE Movers and ISS), which ensured the comparability of the results and allowed for a quantitative assessment of the increase in skills and

competencies. Thus, the data collection procedure was organized, taking into account the principles of experimental pedagogy and ensuring the high validity of the results obtained.

3.3.2. Data Analysis

To process and interpret the obtained data, a quantitative methodology was used with the Student's t-test. Statistical analysis was carried out in two directions: within-group analysis (dependent samples) and between-group analysis (independent samples). To improve the accuracy of the analysis, the data were processed using IBM SPSS Statistics software (version 26). The program made it possible to automate calculations, minimize the influence of the human factor, and obtain reliable results when analyzing large data sets.

In the first stage of the analysis, a paired samples t-test was used, which made it possible to determine statistically significant differences before and after the experiment within each group. For the experimental group, the indicators obtained at the pre-test stage and after training using the Nearpod platform were compared. Similarly, for the control group, the indicators of traditional training at the initial and final stages were compared.

In the second stage, an independent samples t-test was conducted to identify differences between the experimental and control groups after completion of the training. This made it possible to evaluate the effectiveness of the Nearpod digital platform in comparison with traditional teaching methods. The following parameters were calculated: mean values (Mean), standard deviation (SD), t-test values, and significance level (p-value). Differences were considered statistically significant at a significance level of $p < 0.05$, while $p < 0.001$ were interpreted as highly significant differences.

Overall, the applied statistical processing methodology ensured a reliable test of the research hypotheses and made it possible to reasonably interpret the effectiveness of integrating digital technologies into the process of teaching a foreign language and developing intercultural competence.

4. Results

This section evaluates DET, in particular the Nearpod platform, for developing language skills and intercultural competence among primary school students.

4.1. Determining the Level of Language Competence and Intercultural Communication Before Integrating DET into the Educational Process

To compare the mean values of the experimental and control groups, Student's t-test for independent samples was used, as it allows us to determine the statistically significant differences between two independent samples. Table 1 presents the results of the language skills and intercultural competence of students before the integration of DET. The analysis performed shows the standard deviation and mean values of language skills and intercultural competence within the control and experimental groups before the implementation of the DET. The t and p values do not show significant differences between the two scores at the baseline level. In particular, the average scores are below 40%, and writing and reading skills show the lowest scores.

Table 1
Language Skills and Intercultural Competence Before the Integration of the DET

Skill	Experimental Group (Mean ± SD)	Control Group (Mean ± SD)	p-value	t-value	Interpretation
Reading	32 ± 3.4	31 ± 3.2	0.45	0.82	No significant difference
Writing	28 ± 3.1	27 ± 2.9	0.40	0.95	No significant difference
Listening	36 ± 3.5	35 ± 3.3	0.38	1.10	No significant difference
Speaking	29 ± 3.0	28 ± 2.8	0.42	0.88	No significant difference
Intercultural Competence	29 ± 3.1	29 ± 3.0	0.50	0.47	No significant difference

At the early stage of testing, the initial indicators were recorded, taking into account speech activity and intercultural competence. Text comprehension (reading) demonstrated an average score of 32±3.4 in the experimental group and 31±3.2 in the control group, which indicates a basic level of skills. The structure of a written statement was assessed at the level of 28±3.1 in the experimental group and 27±2.9 in the control group, and also confirmed the weak development of written speech skills. Listening skills were at a level higher than others, but also remained at the level of 36±3.5 in the experimental group and 35±3.3 in the control group.

4.2. Evaluation of the Impact of the Integration of DET into Educational Activities

To assess the development of language skills and intercultural competence, a comparative analysis of data before and after the integration of digital educational technologies in the experimental group was conducted. Student's t-test was used to determine the statistical significance of changes in the results achieved by the participants. Comparisons were also made between the experimental and control groups to identify differences in the effectiveness of the approaches used. It should be noted that this study did not quantitatively assess the level of student engagement and interest. The main focus was on analyzing the development of language skills and intercultural competence. However, the level of engagement was recorded qualitatively- by observing student activity during classes on the Nearpod platform: participation in interactive tasks, reaction to multimedia content, interaction on virtual whiteboards, and feedback to the teacher. In the future, to increase objectivity and expand the analysis, it is advisable to include validated quantitative tools aimed at measuring student motivation, engagement, and emotional response, which will allow for a more thorough assessment of the impact of digital technologies on the educational process. As shown in Table 2, the results of the comparison of average scores before and after the implementation of the Nearpod platform in the experimental group are presented, which demonstrate significant improvements in all assessed skills.

Table 2

Comparison of the Mean Scores for the Experimental Group Before and After the Integration of the Nearpod Platform

Skill	Before Training (Mean ± SD)	After Training (Mean ± SD)	p-value	t-value	Interpretation
Reading	32 ± 3.4	92 ± 4.0	< 0.001	15.67	Significant improvement
Writing	28 ± 3.1	91 ± 4.2	< 0.001	14.89	Significant improvement
Listening	36 ± 3.5	94 ± 4.1	< 0.001	16.43	Significant improvement
Speaking	29 ± 3.0	93 ± 4.3	< 0.001	15.12	Significant improvement
Intercultural Competence	29 ± 3.1	92 ± 4.0	< 0.001	14.75	Significant improvement

Table 2 presents a comparative analysis of the average results for each language skill and intercultural competence in the experimental group before and after using the Nearpod platform. All the changes obtained are statistically significant: p values < 0.001, indicating a high level of reliability of the identified progress. Thus, for the reading indicator, the average score increased from 32±3.4 to 92±4.0, indicating an improvement in text comprehension skills. Writing indicators increased from 28±3.1 to 91±4.2, indicating a noticeable development of intelligence to logically and grammatically correctly structure written speech.

Listening skill was initially the strongest area. Listening demonstrated an increase from 36±3.5 to 94±4.1. Improvement in speaking competence, which is measured by confidence, accuracy, and fluency, also featured significantly, with mean scores increasing from 29±3.0 to 93±4.3. Finally, intercultural competence showed valuable progress, improving from 29±3.1 to 92±4.0, which indicates the greatest adaptability and awareness in developing intercultural communication. The results confirm the effectiveness of the Nearpod educational platform in terms of both linguistic and intercultural competence development. Continuous improvement in all skills places particular emphasis on the transformative impact of DET in creating a personalized, interesting, and interactive educational experience.

4.3. Development of Language Skills and Intercultural Competence in the Control Group

One of the key stages of this study was to assess the dynamics of the development of language skills and intercultural competence in students in the control group who were taught using the traditional method without the use of digital educational platforms such as Nearpod. The purpose of the analysis was to determine whether significant changes in the results occurred solely as a result of traditional teaching. To assess the changes, the Student's t-test for dependent samples was used, which made it possible to compare the average values for each indicator before and after the educational period within the control group. This made it possible to identify whether there was an improvement in reading, writing, listening, speaking, and intercultural competence in the context of traditional teaching without the use of digital tools.

Table 3 shows the mean scores before and after training in the control group. For each of the five main skills, the standard deviation and mean values both before and after the educational process are presented. In addition, the t-value and p-level make it possible to reason about the presence of statistically significant differences between the results of pre-testing and post-testing.

Table 3
Evaluation of the Results in the Control Group

Skill	Before Training (Mean ± SD)	After Training (Mean ± SD)	t-value	p-value
Reading	31 ± 3.2	33 ± 3.5	1.15	> 0.05
Writing	27 ± 2.9	29 ± 3.2	1.23	> 0.05
Listening	35 ± 3.3	36 ± 3.6	1.05	> 0.05
Speaking	28 ± 2.8	29 ± 3.1	0.98	> 0.05
Intercultural Competence	29 ± 3.0	30 ± 3.2	0.87	> 0.05

The results presented in Table 3 demonstrate the changes in the level of language skills and intercultural competence of the students in the control group after completing the course based on traditional teaching. Although there was a slight increase in the mean values for all parameters – reading, writing, listening, speaking, and intercultural competence – statistical analysis showed that these changes are not significant in terms of reliability ($p > 0.05$). For example, the level of reading increased from 31 ± 3.2 to 33 ± 3.5, writing – from 27 ± 2.9 to 29 ± 3.2, and listening – from 35 ± 3.3 to 36 ± 3.6, but the t-values remained below the threshold values. Such results indicate the lack of significant progress in the development of both language and intercultural training of students when using exclusively traditional methods. This highlights the need to implement digital educational technologies that can improve the effectiveness of learning through interactivity, multimodality, and personalization of the educational process.

Table 4 compares the results obtained in the control and experimental groups after the training using an independent t-test. For each of the five key skills, the mean values and standard deviations obtained in both groups based on the results of the final testing are presented. Additionally, the t-values and the significance level (p-value) calculated using Student's t-test for independent samples are presented, which allows us to judge any statistically significant differences between the results of the control and experimental groups.

Table 4
Comparison of the Control and Experimental Groups after the Training

Skill	Experimental Group (Mean ± SD)	Control Group (Mean ± SD)	t-value	p-value
Reading	92 ± 4.0	33 ± 3.5	14.45	< 0.001
Writing	91 ± 4.2	29 ± 3.2	13.89	< 0.001
Listening	94 ± 4.1	36 ± 3.6	15.67	< 0.001
Speaking	93 ± 4.3	29 ± 3.1	14.23	< 0.001
Intercultural Competence	92 ± 4.0	30 ± 3.2	13.95	< 0.001

The results presented in Table 4 demonstrate significant differences in the levels of development of language skills and intercultural competence in students who completed training using the Nearpod platform compared to those who studied according to the traditional program. In particular, there is a significant increase in the mean values of the experimental group: the reading skill level increased to 92 ± 4.0 compared to 33 ± 3.5 in the control group; writing increased up to 91 ± 4.2 versus 29 ± 3.2; listening increased up to 94 ± 4.1 versus 36 ± 3.6; speaking increased up to 93 ± 4.3 versus 29 ± 3.1; and intercultural competence increased up to 92 ± 4.0 versus 30 ± 3.2. In this case, the t-values for all cases significantly exceed the threshold values and range from 13.89 to 15.67. The p-values also indicate high statistical significance of the differences.

Thus, the obtained data confirm that the integration of DET, in particular the Nearpod platform, has a significant positive impact on the development of linguistic and intercultural competencies in primary school students. This emphasizes the effectiveness of digital approaches based on interactivity, multi-modality, and personalization of the educational process, compared to traditional teaching methods.

5. Discussion

The main objective of our study was to examine the effect of DET on the development of foreign language and intercultural skills of primary school students. Current educational technologies play a significant role in the process of foreign language learning, making it possible to use interactive and multimodal educational materials that help to improve the effectiveness of education. The study included an analysis with the participation of two groups: experimental and control. The experimental group used the Nearpod educational platform, while the control group used traditional teaching methods. The study supports the opinion of previously conducted studies on the significant impact of DET on students' language skills. The obtained data confirm the results of previous scientific studies on the significant impact of digital technologies on students' language skills. Thus, according to Mayer (2022), the use of multimodal content of educational material activates various cognitive processes of students, which provides a deeper and more meaningful understanding of the educational material.

The results of our study are also consistent with the findings of Korosidou and Griva (2024), who support that the introduction of digital platforms expands students' academic resources and opens up new opportunities for their cognitive activity. In addition, there are parallels with the work of Chun et al. (2016), which implements the innovative potential of the DET in taking into account the intercultural competence of students. Participation in digital interactive tasks, learning language and culture, developing tolerance, empathy, and a more conscious perception of cultural diversity contribute to the formation of intercultural competence and the development of interpersonal communication skills in students. Such activities help engage students in dialogue with different cultures, even within the virtual classroom, and can be effectively integrated into the learning process. Although both groups showed improved results, the experimental group made significant progress, especially in speaking, listening, and intercultural communication, which ensures the effectiveness of the Nearpod platform. As emphasized by Tleuzhanova et al. (2021), digital technologies expand the possibilities of interaction in various educational environments, contributing to the development of global thinking and the formation of competent intercultural interaction.

An important point that is used in mastering digital technologies has been adapted to take into account the age characteristics of younger students, which ensures a high level of personalization of learning and stimulates the development of their independence in learning a foreign language. It would be wiser to say that adapted digital technologies aimed at the primary school age allow for a high level of personalization of learning. Such technological advances allow for the use of this accessory and independent development in learning a foreign language, which is especially important in primary school. Nearpod's interactive and multimedia educational platforms help students improve their intercultural competence by enabling them to practice language tools in their own scenarios. The use of DET stimulates cognitive processes and improves the ability to analyze the information received. This is taken into account in the study by Toleubekova et al. (2016) on methods for developing modern methods in foreign language education.

Further research should be aimed at studying the long-term impact of digital technologies on the social adaptation of students since successful integration into the sociocultural environment is an important factor in the formation of communication and interpersonal skills in the context of a globalized educational space. In addition, it is of particular importance to study the impact of teachers' readiness on the successful implementation of DET in the foreign language educational process. One promising trend is the design of adaptive educational platforms with the implementation of artificial intelligence, which makes it possible to improve individualization and learning effectiveness.

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