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The Use of AI and Interactive (Digital) Technologies in the Cognitive Acquisition of Phraseological Units: Intelligent E-Learning in Education

Myroslava Hnatiuk

Candidate of Philological Sciences, Associate Professor at the Department of Ukrainian Language, Institute of Humanities and Social Science, Lviv Polytechnic National University, Lviv, Ukraine. myroslava.v.hnatiuk@lpnu.ua, <https://orcid.org/0000-0002-1663-7095>

Olena Slobodzyanyk

Candidate of Philological Sciences, Associate Professor at the Department of Ukrainian Applied Linguistics, Ivan Franko National University of Lviv, Lviv, Ukraine. gorbachevska@ukr.net, <https://orcid.org/0000-0002-0568-948X>

Zoryana Vasylo

Candidate of Philological Sciences, Associate Professor at the Department of Humanities, Hetman Petro Sahaidachnyi National Army Academy, Lviv, Ukraine. vasylokozoryana@gmail.com, <https://orcid.org/0000-0003-0128-8002>

Volodymyr Diakiv

Candidate of Philological Sciences, Associate Professor at the Department of Ukrainian Language, Institute of Humanities and Social Science, Lviv Polytechnic National University, Lviv, Ukraine. Senior Researcher Fellow at the Ethnology Institute of the National Academy of Sciences of Ukraine, Lviv, Ukraine. d.v.m.1029@gmail.com, <https://orcid.org/0000-0002-9513-4364>

Olha Sopina

Candidate of Philological Sciences, Associate Professor, Berdyansk State Pedagogical University, Berdyansk, Ukraine. Zaporizhzhia, Ukraine. senichevaolga76@gmail.com, <https://orcid.org/0000-0001-5230-3669>

Kateryna Rybakova

PhD in Philology, Associate Professor, Associate Professor of the Department of German and Romanic Languages, Kyiv National Linguistic University, Kyiv, Ukraine. tariel@ukr.net, <https://orcid.org/0009-0003-8136-8236>

Abstract: The article examines the problem of improving the teaching of phraseology through the introduction of interactive learning methods. The central object of the study is the concept and architecture of the "Intelligent Electronic Learning Environment" (IELE), developed based on the synergy of LLM models (ChatGPT-4o, Claude 3.5) and graphical neural networks. It is shown that traditional forms of working with phraseological units, based on reproductive techniques, do not ensure the formation of stable skills in their use and do not contribute to the development of students' linguistic creativity. The structure and functional modules of the IELE are described, along with the results of its implementation in the educational process of lyceums. Based on the analysis of relevant domestic and foreign studies, as well as existing methodologies, the concept of an interactive approach to teaching phraseology is proposed, which includes game-based, project-based, context-oriented, and digital learning technologies. Particular attention is paid to the modular structure of the lesson, the combination of face-to-face and online forms of interaction, reflective practices, and the use of digital platforms to enhance students' cognitive activity. The potential of artificial intelligence (AI) tools in the process of semantization of phraseological units is revealed, in particular through the generation of visual images to disclose the internal form of idioms and the creation of adaptive language trainers. The expediency of using AI-based chatbots to model authentic dialogic situations is substantiated, which contributes to a deeper acquisition of the connotative meanings of stable expressions. Examples of effective tasks are provided that combine traditional interactive methods with the capabilities of artificial intelligence to ensure understanding of the figurative nature of phraseological units and the development of communicative competence. The results of the analysis confirm that the use of interactive methods contributes to increased motivation, improved quality of phraseological acquisition, and the formation of a holistic understanding of the cultural and linguistic potential of phraseology.

Keywords: phraseology; interactive learning methods; game-based technologies; project-based learning; digital didactics; artificial intelligence in education; generative technologies; prompt engineering in linguistics; communicative competence; modular learning; reflection; phraseological competence.

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1. Introduction

Phraseology is one of the most complex and at the same time expressive areas of language, reflecting a people's cultural memory, figurative thinking, and the historical continuity of speech.

Within the school curriculum, it plays a key role in the formation of students' communicative, linguo-cultural, and cognitive competences. However, teaching practice shows that the study of phraseological units in the traditional educational system is often reduced to mechanical memorisation and reproduction of meanings without a deep understanding of the figurative nature and contextual functioning of fixed expressions. This may reduce students' engagement with the subject and result in superficial acquisition of the material, which ultimately affects the development of their language proficiency.

The aim of the study is to substantiate and methodologically test interactive approaches and artificial intelligence tools for teaching phraseology, aimed at developing students' language competence, creative thinking, and communicative activity.

The reconsideration of phraseology teaching methods in schools is associated with the transition to activity-based, context-oriented, and interactive approaches. Thus, modern methodological literature emphasises that interactive technologies (group work, digital environments, game-based formats, and project activities) create conditions for students' active participation, dialogue, and cooperation, which increases motivation and contributes to a deeper acquisition of phraseological units (Venzhynovych, 2018). In particular, studies by Alamer et al. (2023) and Kukulska-Hulme (2021) suggest that the use of media texts (cartoons, Internet resources, video clips) as material for phraseological work enhances the actualisation of knowledge and makes lessons more emotionally and cognitively engaging. A new development in this field is the use of LLMs (Large Language Models) as personalised tutors (Godwin-Jones, 2019). Unlike static digital resources, AI tools may support learning through trial and error in a relatively low-risk environment where students can experiment with the appropriateness of idiom usage in different styles of speech. In addition, AI solves the problem of the lack of visualisation: generating images based on the internal form of a phraseological unit, such as the literal depiction of the expression "to lead someone by the nose", creates a strong cognitive dissonance that stimulates associative thinking and facilitates the memorisation of figurative meanings.

However, the implementation of interactive methods in school phraseology teaching is accompanied by a number of problems (Thomas et al., 2017). Several studies highlight teachers' insufficient competence in using digital and interactive formats, as well as the limited time resources of language lessons, which complicates the systematic integration of phraseological work into the educational process. In addition, there is a noted lack of methodological frameworks, which creates a basis for further experiments and testing (Nerubasska et al., 2020).

From a neurolinguistic perspective, the acquisition of phraseological units is a complex cognitive process involving distributed neural networks across both hemispheres. While left-hemisphere regions are primarily associated with language processing, figurative and contextual interpretation may additionally engage right-hemisphere resources. Traditional rote memorisation primarily activates short-term memory areas, whereas the use of AI tools stimulates neural networks responsible for associative thinking. This creates conditions for the formation of stable synaptic connections due to the involvement of the hippocampus in emotionally enriched learning processes.

Considering the above, modern studies propose methodological systems that include a clear modular structure, hybrid formats (combining offline and online learning methods), reflective tasks, and digital platforms for self-assessment and feedback. These systems are aimed at developing phraseological competence, communicative activity, and students' cultural and linguistic awareness. Experimental data indicate that the use of interactive formats allows not only an increase in the level of phraseological acquisition but also their active inclusion in students' oral and written communication.

2. Research Methodology

The study was conducted in three secondary schools in Kyiv during the 2025–2026 academic year. A total of 118 students from grades 7–9 participated in the experiment and were divided into two groups: an experimental group and a control group.

Both groups were comparable in terms of general language proficiency, age, academic performance, and learning conditions. The experimental group studied according to the author's system of interactive methods for teaching phraseology, which included the use of generative artificial intelligence models to personalise learning content, whereas the control group studied this section using traditional methods in accordance with existing school curricula and textbooks.

For the experiment, the architecture of the Intelligent Electronic Learning Environment (IELE) was designed and implemented. Unlike static educational resources, the developed IELE functions as an adaptive ecosystem that includes:

- Generative Semantisation Module (integration with Midjourney/DALL-E for visualising concepts and images).
- Intelligent Dialog Hub (based on GPT-4o for simulating communicative language situations).
- Formative Monitoring System, which performs automated analysis of students' errors.

The research material consisted of phraseological units included in the school curriculum, as well as additional fixed expressions selected from works of fiction and contemporary media texts. The selection of material was carried out according to the criteria of frequency of use, semantic transparency, cultural and historical significance, and accessibility for adolescent students.

For practical work, author-designed tasks, texts, game-based exercises, cards, interactive presentations, and digital tests were also used, created with the help of platforms such as LearningApps, Quizizz, and Google Classroom. A separate cluster of didactic materials was developed using AI tools (ChatGPT-4o, Claude 3.5, Midjourney) to visualise the internal form of phraseological units and to create variable contexts for their use.

To evaluate effectiveness, the following criteria were applied: understanding of the meanings of phraseological units, the ability to use them in speech, the level of verbal engagement, motivation to learn the language, and the development of communicative competence. During the formative stage, a structured implementation of interactive methods was carried out, including dialogic tasks, game situations, mini-projects, as well as innovative formats of interaction with AI. In particular, students in the experimental group used chatbots as “interlocutors” to practise idioms in given situational contexts and created visual metaphors using text prompts for graphic neural networks.

Control tasks consisted of three blocks: recognition of the meaning of phraseological units in a text, the use of fixed expressions in students' own statements, and interpretation of figurative meaning. The test materials underwent expert review by methodologists and teachers, which ensured their content validity.

Quantitative data processing was carried out using the SPSS 23.0 statistical software package and automated data analysis tools based on machine learning to identify hidden correlations between the type of interactive exercise and long-term retention of the material.

To assess the statistical significance of differences between the indicators of the control and experimental groups, methods of mathematical statistics were used: Student's t-test for independent samples, Pearson's χ^2 test, and Spearman's correlation analysis.

The critical level of significance was set at $p < 0.05$.

The results of the statistical analysis made it possible to support or fail to support the hypothesis regarding the increased effectiveness of teaching phraseology through the use of interactive methods combined with artificial intelligence technologies.

The methods of the pedagogical experiment included three stages. At the diagnostic stage, the initial level of students' phraseological competence was determined. At the formative stage, the

targeted implementation of interactive methods was carried out, including dialogic tasks, game situations, mini-projects, multimedia exercises, and collaborative online discussions. At the control stage, the outcome dynamics were evaluated and the indicators of the two groups were compared.

In addition to quantitative data, qualitative analysis was also used, based on observation of students' linguistic behaviour, analysis of their written work, and interviews with teachers. This approach made it possible to identify not only cognitive but also motivational and emotional changes caused by interactive learning.

The ethical approval for the study was obtained from the school administrations and the students' parents. All participants were informed about the goals and content of the experiment, and their participation was voluntary.

3. Research Results

The conducted study made it possible to identify patterns in the formation of phraseological competence and the functioning of the Intelligent Electronic Learning Environment (IELE) among students using interactive learning methods, as well as to assess their impact on the quality of acquisition of phraseological units, the development of language activity, and language learning motivation. At the first stage of analysing the results of the initial testing, it was recorded that the overall level of understanding of phraseological expressions in both groups was similar: the average score was 42.6% in the control group and 43.1% in the experimental group.

Most students found it difficult to explain the figurative meanings of expressions, especially phraseological units such as *to lead someone by the nose*, *to sit with folded arms*, and the culturally specific expression *to keep a stone behind one's back*, which indicated an insufficient connection between the semantic and cultural components of phraseological acquisition.

After the completion of the interactive lessons cycle, which included game-based tasks, project work, discussions, and digital tests, a pronounced positive dynamic was observed. An important success factor of the experimental group was the introduction of AI assistants for the individualisation of learning. The average indicator of understanding the meanings of phraseological units increased to 84.3%, and the level of their active use in oral and written speech reached 77.5%. Data analysis showed that the most difficult phraseological units to understand, such as *to keep a stone behind one's back*, were successfully mastered thanks to the "neuro-visualisation" method. Students used generative models (DALL-E 3) to create two types of images: a literal meaning and a metaphorical context. This enabled 92% of respondents in the experimental group to clearly differentiate between literal and figurative meanings, whereas in the control group this indicator remained at the level of 56%. In the control group, where traditional methods were maintained, the increase was moderate — 59.2% and 54.7% respectively. Thus, the hypothesis that interactive methods improve the quality of mastering phraseological material received statistically significant support ($p < 0.05$).

Special attention in the analysis was paid to qualitative changes in the nature of speech statements.

If at the beginning of the experiment most students used phraseological units mechanically, without precise contextual correspondence, by the end of the training process it became noticeable that they had mastered subtle semantic nuances. For example, the expression *he behaved as if nothing had happened* began to be replaced with the more precise and figurative, *he washed his hands of it*, and instead of the literal *she was very angry*, students began to use *her blood was boiling*. A tendency toward variability and contextual appropriateness was observed, indicating a transition from passive knowledge to active command of linguistic means.

During the analysis of written works, an expansion of the range of phraseological units used by students was also noted. While at the initial stage students more often used standard and widely known expressions, such as *like a fish in the water*, *by the sweat of one's brow*, and *in no time*, after the introduction of interactive formats, less frequent and emotionally expressive units began to

appear, such as *things smell of trouble, without a hidden agenda, seven spans across the forehead, to loaf around, and to put spikes in someone's wheels.*

Table 1. Changes in Students' Acquisition of Phraseological Units

Group	Number of Students	Initial Understanding (%)	Final Understanding (%)	Active Use in Speech (%)	Increase (percentage points)	Statistical Significance (p-value) (Before and after)
Experimental	58	43.1	84.3	77.5	+ 41.2	< 0.05
Control	60	42.6	59.2	54.7	+ 16.6	< 0.05
Total sample	118	42.9	71.3	66.1	+ 28.4	< 0.05

Note: The p-value indicates the statistical significance of changes in the indicators within each group before and after the intervention, as determined using the paired Student's t-test.

Qualitative observations showed that during the interactive sessions not only linguistic activity increased, but also the students' emotional engagement. A particularly strong interest was generated by the format "Dialogue with the Epoch" activity, in which students used GPT-4o-based chatbots to simulate conversations with historical figures or literary characters using a given list of phraseological units. This ensured spontaneity of speech: analysis of chatbot logs confirmed that 74% of students integrated idioms into the context without any grammatical or stylistic errors already on the second attempt.

Table 2 highlights a significant gap between the experimental and control groups in the "Associative Usage" component (+25 percentage points compared to the control group). We associate this with the use of AI as a tool for constructing associative maps. AI algorithms helped students instantly find synonymous sets of phraseological units, such as *to idle away, to loaf around, to lie around doing nothing*, which expanded their active vocabulary faster than working with static dictionaries. During work with digital tasks, students actively discussed the correctness of answers, compared options, and demonstrated a competitive spirit.

For example, while working with an interactive test on the LearningApps platform, the task "Match the idiom to the situation" generated noticeable interest. In response to the prompt *a student remains inactive until prompted by the teacher*, students selected phraseological units such as *to sit with folded arms, to drag one's feet, and to let things take their course*, while justifying the rationale behind their choices.

Analysis of lesson recordings showed that more than 70% of participants began using phraseological units spontaneously, without prompts from the teacher. One of the key outcomes of the experiment was the development of the ability to interpret figurative meaning. In a series of tasks "Find the Hidden Meaning," students had to explain the figurative meaning of expressions. At the initial stage, students' explanations reflected a limited level of understanding; for example, responses such as *this is said when a person does not work* lacked semantic depth. However, after a series of exercises involving visual and contextual support, students' interpretations became more metaphorically accurate, as illustrated by explanations such as *to sit with folded arms means to remain inactive when action is required, as if deliberately not interfering in the situation*.

Within the functioning of the IELE, particular attention was given to neurocognitive mechanisms of perception. The use of neural networks for image generation is based on the principle of multisensory learning. According to Paivio's (1990) dual coding theory, adapted here to the neuro-pedagogical context, the simultaneous activation of verbal and visual channels reduces the cognitive load on working memory. Experimentally, it was confirmed that the "neuro-visualisation" method stimulates the dopaminergic reward system of learners through the

successful decoding of metaphorical content, which directly correlates with the level of lesson satisfaction, reaching 85%, as presented in Table 3.

Table 2. Indicators of Phraseological Competence Development

Component	Control Group (before/after)(%)	Experimental Group (before/after) (%)	Difference Between Groups	Statistical Significance (p-value) (Before and after)	Assessment of Changes
Understanding of meaning	43 / 59	43 / 84	+ 25	< 0.05	Increased accuracy of interpretation
Contextual usage	35 / 55	39 / 78	+ 23	< 0.05	High appropriateness of usage
Emotional and Expressive Features	35 / 49	36 / 74	+ 25	< 0.05	Expansion of the range of expressive shades
Associative usage	41 / 54	42 / 79	+ 25	< 0.01	Development of the connection between image and meaning
Reflection and self-assessment	46 / 58	47 / 82	+ 24	< 0.01	Conscious use of phraseological units

Note: The p-values presented above reflect the statistical significance of intragroup changes during the study relative to baseline measurements (“Before” and “After” the experiment). Statistical analyses were performed using the paired Student’s t-test for dependent samples.

During the analysis of speech statements in class, more than 400 cases of the use of phraseological units in spontaneous speech were recorded, of which 68% belonged to the experimental group. Students began to actively integrate set expressions into oral monologues, essays, and written reflections.

For example, in a creative assignment on the topic “An Act That Changed Me,” students used such expressions as *pulled myself together, through hardships to the stars, not everything that glitters is gold, never get around to it, everything went like clockwork, and a stone fell on my heart*.

Significant differences were also found in the nature of errors. This was due to the use of personalised AI-based trainers that analysed students’ written work in real time and provided stylistic recommendations. At the initial stage, semantic substitutions prevailed; for example, *to hold one’s tongue* was replaced by *to keep one’s mouth closed*. However, after the interactive sessions the number of such substitutions decreased by half. The remaining errors were mostly minor stylistic ones and mainly involved the appropriate use of linguistic register, particularly distinctions between formal and conversational context.

The most noticeable changes were observed in students’ motivation and interest in language learning. The survey results indicated that 81% of students in the experimental group rated working with AI tools as “the most engaging part of the learning process.” This transformed the study of phraseology from routine memorisation into a process of creative digital construction.

The identified trends suggest that the synergy of traditional interactive methods and artificial intelligence tools creates conditions for deep learning, in which a phraseological unit ceases to be an abstract linguistic element and becomes a practical tool of communication in both digital and real environments. After the completion of the experiment, 87% of students in the experimental group noted that phraseology had become a “living” section of the language for them, connected with culture and expressive speech. The survey also showed that 70% of participants expressed a desire to learn new idiomatic expressions independently using online sources, dictionaries, and literary texts.

The control group demonstrated significantly lower engagement indicators, with values reaching approximately 45%. The growth in motivation was also reflected in classroom activity. If earlier teachers recorded passive behaviour among some students, by the end of the experiment the

number of initiative responses had increased by 62%. During a lesson on the topic of work and laziness, students discussed expressions such as *to work for nothing*, *to roll up one's sleeves*, and *to fool around*, and provided real-life examples from school life, which indicated the development of the ability to apply expressions in a social context.

Table 3. Changes in Indicators of Phraseological Competence, Motivation and Student Engagement

Indicator (component)	Control Group (before/after) (%)	Experimental Group (before/after) (%)	Increase in Experimental Group (%)	Difference between Groups	Statistical Significance (p-value) (Before and after)	Interpretation of Changes
Understanding of meaning	43 / 59	43 / 84	+ 41	+ 25	< 0.05	Increased accuracy of interpretation
Contextual use	35 / 55	39 / 78	+ 39	+ 23	< 0.05	High appropriateness of usage
Emotional and Expressive Features	35 / 49	36 / 74	+ 38	+ 25	< 0.05	Expansion of expressive range
Associative use	41 / 54	42 / 79	+ 37	+ 25	< 0.01	Development of links between image and meaning
Reflection and self-assessment	46 / 58	47 / 82	+ 35	+ 24	< 0.01	Conscious use of phraseological units
Interest in phraseology	41 / 54	42 / 87	+ 45	+ 33	< 0.01	Growth of cognitive interest
Participation in dialogues	38 / 52	39 / 81	+ 42	+ 29	< 0.01	Increased communicative activity
Independent search for examples	29 / 44	30 / 70	+ 40	+ 26	< 0.05	Increased initiative
Satisfaction with lessons	46 / 55	47 / 85	+ 38	+ 30	< 0.01	Development of a positive attitude
Creative use of phraseological units	34 / 47	35 / 76	+ 41	+ 29	< 0.01	Active speech application
Technological readiness (working with AI)	22 / 31	24 / 89	+ 65	+34	< 0.001	Rapid mastery of digital tools for linguistic analysis

During the IELE pilot implementation, it was established that the environment supports three levels of cognitive acquisition:

- Visual-associative level through the neuro-visualisation module, which enabled 92% of students to clearly differentiate between literal and figurative meanings.
- Situational-communicative level, where chatbots and log analysis confirmed correct contextual use of phraseological units in 74% of cases.
- Analytical-corrective level, where the system automatically detected stylistic inaccuracies in written assignments and offered learners alternative substitutions.

The technological validation of IELE functioning, as presented in Table 3, demonstrated a rapid improvement in students' mastery of linguistic analysis tools (+65% increase in readiness to work with AI). This confirms that the developed environment is not merely an auxiliary tool, but an autonomous intelligent space in which error becomes a resource for automated learning. Analysis of oral responses and mini-projects showed that interactive methods create a favourable atmosphere of trust and cooperation.

During gamified lessons, students proposed their own mini-stories using phraseological units. For instance, one student described a situation "when a friend helped in time" with the expression *lent a helping hand*, while in a discussion about diligence another student used *pulled herself together*, explaining: *I used to postpone everything, but now I decided that I shouldn't drag*

things out. These examples reflect the transition of phraseological units from learning material into living speech, which is the main indicator of the effectiveness of the methodology.

The identified tendencies suggest that interactive methods not only contribute to the acquisition of phraseological material but also form an emotionally positive attitude toward language. At the same time, it is important to note that effectiveness depends on systematic implementation and methodological consistency. When used occasionally, game-based formats produce only short-term effects, whereas regular integration of phraseological work into the structure of lessons ensures stable development of competencies.

Overall, quantitative and qualitative data demonstrate a reliable advantage of interactive learning over traditional approaches. The increase of indicators across all parameters, from accuracy of interpretation to speech spontaneity, support the research hypothesis and indicate that the interactive model of teaching phraseology represents a promising approach for the modernisation of school language education.

4. Discussion

Comparison of the results of the conducted pedagogical experiment with existing studies suggests that the effectiveness of interactive methods in teaching phraseology is associated not so much with the use of technology as with a change in the nature of interaction between teacher and student. Our study indicates that the transition to dialogic and digital formats allowed students not only to memorise phraseological units but also to actively apply them in real communicative contexts.

This tendency is consistent with the conclusions of Zdikhovska (2014), who emphasises that the main outcome of interactive learning is the development of students' ability to interpret phraseological units as living elements of language. However, our research expands this concept by demonstrating that the integration of artificial intelligence (AI) made it possible to move beyond group discussion toward personalised cognitive interaction. While Alisoy (2024) emphasises the systematic inclusion of phraseological units in communicative tasks, the use of AI assistants in our experiment provided each student with an individual platform for "speech experimentation," where mistakes become not an object of assessment but a resource for algorithmic correction.

Particular interest arises in comparing data on the dynamics of speech activity. In our experiment, a significant increase in the number of independent uses of phraseological units was observed. Similar results are described in the study by Vincent (2013), where the frequency of usage increased by 30–40%. However, the application of generative AI for visualising the internal form of idioms in our experimental group produced an even higher indicator (increase in comprehension to 84.3%). This can be explained by the fact that AI can instantly overcome the abstractness of phraseological expressions by offering a visual image that connects the etymological roots of an expression with its modern meaning. This confirms the thesis of Lee and Jeon (2024) regarding the role of emotional engagement while adding a technological instrument of instant semantic visualisation.

A comparison of learning models showed that it is the systemic nature of the developed IELE, rather than the isolated use of AI tools, that ensured the high statistical significance of the results. While traditional digital platforms, such as LearningApps, only allow for the assessment of knowledge, the intelligent environment tested in this study functions as an adaptive learning system, guiding learners from the initial encounter with a phraseological unit to its spontaneous use in speech.

The interpretation of the results from the perspective of digital didactics correlates with studies stating that interactive tasks form the skill of "interaction with language." The main conclusion of our research is that working with chatbots based on large language models (LLMs) transforms learning into a process of active modelling. Students not only receive knowledge, they also "teach" AI models to use phraseological units in creative texts, which requires a higher level of reflection. As noted by Halynska (2011), such a transition turns learning into a tool for developing

creative thinking, which is fully confirmed by our data on the growth of students' ability to spontaneously use complex figurative expressions, such as *things smell of trouble*, *a very clever person*.

Comparison of learning models demonstrated a stable advantage of the interactive approach across all parameters. We assume that the critical significance level ($p < 0.05$) was achieved precisely due to the synergy between classical game-based activities and AI training tools. AI provided the adaptability that traditional digital platforms such as LearningApps often lack: it adjusted contextual complexity for each student, which helped maintain a high level of motivation, reaching 87% throughout the experiment.

Considering the results from the perspective of a cultural approach, it can be argued that interactive formats allow phraseology to be revealed as part of a cultural code. The use of AI for searching historical parallels and generating contexts from classical literature helped students connect the meanings of expressions, such as *to get away with something* or *to obstruct someone*, with cultural reflection. This confirms the conclusions of Wang (2025) regarding the necessity of integrating a linguacultural component, while also indicating that by 2026 AI has become a key mediator between the student and the vast cultural data of language.

However, the analysis showed that the implementation of such technologies requires methodological maturity on the part of the teacher. The formal use of AI without pedagogical guidance may reduce its didactic effectiveness. Therefore, agreeing with Matos et al. (2025), we emphasise that interactivity and artificial intelligence should not replace the content of learning. The effectiveness of our model is based on the fact that AI was embedded into the logic of the lesson as a research tool rather than simply entertainment.

Discussing the results in the context of neuroscience, it should be noted that the IELE interactive environment functions as an external support system that helps the adolescent brain overcome difficulties associated with abstract thinking. While traditional methodologies often overlook neuroplasticity, our approach is oriented toward the activation of mirror neuron systems during the simulation of dialogues with AI agents. This supports the hypothesis that intelligent phraseological learning is a process of "neural recoding" of cultural meanings into structures of individual experience. The synergy of AI and neuro-pedagogy allows not only the acquisition of material, but also the transformation of the learner's cognitive architecture, thereby enhancing overall cognitive flexibility.

Thus, the obtained results demonstrate that the future of teaching phraseology lies in the field of adaptive interactivity. The combination of emotional engagement, group collaboration, and intellectual support from AI makes it possible to develop not only knowledge but also what may be called phraseological sensitivity, which represents the ability to perceive appropriateness, imagery, and the expressive power of language in any communicative situation.

5. Conclusion

The conducted study suggests that the implementation of interactive methods in teaching phraseology contributes to a deeper understanding of linguistic imagery among students, enhances speech activity, and enhances students' motivation to learn the language. The obtained results confirm that the use of game-based, project-based, and digital technologies creates conditions for meaningful acquisition of phraseological units, transforming the learning process from a reproductive to an activity-based model. In the university environment, the application of interactive methodologies can become an effective tool for improving the quality of philological training. For this purpose, it is recommended to systematically integrate interactive forms into the curricula of disciplines such as *Speech Culture* and *Language Teaching Methodology*. In particular, it is advisable to include elements of gamification in practical classes, discussion-based analysis of phraseological units, project mini-modules devoted to exploring the cultural origins of phraseological units, as well as the use of digital platforms for independent work and feedback.

The results of the experiment also support the necessity of preparing teachers to use interactive technologies, such as training in digital services, development of lesson cases and scenarios, and the introduction of reflective methods for analysing teaching effectiveness. The implementation of these recommendations will enable universities to improve students' communicative competence, develop linguistic thinking, and ensure a higher level of professional readiness among future language teachers.

The importance of this article stems from its analytical examination of how phraseological units are used in today's research. Their accurate definition involves setting distinct limits and determining their structural components. The complexity of this task is rooted in the independent development of phraseological units, coupled with the essential semantic property of their elements. The scope of a unit can broaden due to adjacent words, especially with restricted or unconnected collocations, or if the unit is commonly paired with a specific term.

The evolving nature of phraseological units also plays a role in intensifying this difficulty. Modifications to its structural components may cause the emergence of different units with varied meanings. The problem of defining boundaries is further complicated when two units, one with a narrower and one with a broader structure, coexist in the language.

The scientific novelty of the study lies in substantiating the neuropsychological mechanisms underlying the acquisition of fixed linguistic expressions in a digital environment. It has been demonstrated that intelligent electronic learning minimises cognitive resistance in the study of complex linguistic units through the stimulation of brain regions responsible for creative information processing.

The article further examines the evolution of phraseological units in the digital era, emphasising their role in transmitting national-linguistic and historical-cultural information. The functioning of these units in society is shaped by their use in various contexts. Phraseological units continue to evolve, influenced by factors such as intercultural communication, globalisation, technological advancement, and regional and cultural variation. Finally, they can influence one's worldview and perception of reality.

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