



Использование технологий искусственного интеллекта для развития навыков иноязычного говорения у студентов университета

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АННОТАЦИЯ

Введение. Современные вызовы рынка труда требуют от выпускников вузов высокого уровня иноязычной коммуникативной компетенции, что является ключевым условием успешной профессиональной деятельности в условиях цифровой трансформации отраслей экономики. Внедрение технологий искусственного интеллекта в образовательный процесс открывает новые возможности для развития навыков иноязычного говорения. В связи с этим актуальной становится задача разработки и проверки методики интеграции инструментов искусственного интеллекта в процесс обучения иноязычной речи. *Цель исследования* — выявить влияние использования инструментов искусственного интеллекта на развитие навыков иноязычного говорения у студентов неязыковых направлений подготовки.

Материалы и методы. В эксперименте участвовали 76 студентов первого курса Вятского государственного университета, экспериментальная группа ($n=38$) и контрольная группа ($n=38$), обучающихся по направлениям «Биотехнология» и «Биология». Экспериментальная группа проходила восьминедельное обучение по разработанной методике с использованием инструментов ИИ, включающей шесть последовательных этапов. До и после эксперимента проводилось диагностирование уровня развития навыков иноязычного говорения по адаптированным дескрипторам CEFR. Для статистической обработки данных был использован критерий Пирсона χ^2 .

Результаты. Разработанная методика из шести последовательных этапов включает знакомство с ИИ-инструментами, расширение профессиональной лексики, подготовку выступлений с презентациями, ролевые игры с ИИ, ведение дискуссий и итоговую рефлекссию. Результаты эксперимента показали, что в экспериментальной группе доля студентов с высоким уровнем навыков говорения увеличилась с 13,1% до 52,6%, доля студентов с низким уровнем снизилась с 44,7% до 5,3% ($\chi^2 = 17,22$, $p \leq 0,05$).

Заключение. Значимость проведенного исследования заключается в использованном подходе к решению проблемы развития навыков иноязычного говорения, который предполагает обучение по разработанной методике с использованием комплекса ИИ. Результаты подтверждают перспективность предложенной методики обучения, которая обеспечивает многоуровневую обратную связь, развивает автономность и критическое мышление, сохраняя ведущую роль преподавателя.

КЛЮЧЕВЫЕ СЛОВА

навыки иноязычного говорения, инструменты искусственного интеллекта, этапы обучения говорению с использованием ИИ

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Using Artificial Intelligence Technologies to Develop Foreign Language Speaking Skills in University Students

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ABSTRACT

Introduction. Due to the challenges in today's labor market, university graduates are required to demonstrate a high level of foreign language communicative competence, which is key to successful professional activity in the context of the digital transformation of economic sectors. The introduction of artificial intelligence technologies into the educational process opens up new opportunities for developing foreign language speaking skills. In this regard, designing and testing methods for integrating AI tools into the process of teaching foreign language speaking becomes relevant. *The purpose of this study* is to identify the impact of using AI tools on the development of foreign language speaking skills in students majoring in non-linguistic fields.

Materials and methods. The study involved 76 first-year students in the fields of "Biotechnology" and "Biology" from Vyatka State University. The experimental group consisted of 38 students, and the control group consisted of 38. The experimental group underwent eight-week training course using the developed methodology with AI tools, that included six consecutive stages. Before and after the experiment, the level of development of foreign language speaking skills was assessed using adapted CEFR descriptors. For statistical processing of the data, Pearson's chi-square test was used.

Results. The developed methodology comprised six consecutive stages and included introduction to AI tools, increasing professional vocabulary, preparing presentations, role-playing with AI, participation in discussions, and final reflection. The results of the experiment have shown that the proportion of students with a high level of speaking skills increased from 13.1% to 52.6% in the experimental group, while the proportion of students with a low level decreased from 44.7% to 5.3% ($\chi^2 = 17,22$, $p \leq 0,05$).

Conclusion. The significance of this study lies in the approach used to develop foreign language speaking skills, which involves teaching with the developed methodology and AI tools. The results confirm the prospects of the proposed methodology that provides multi-level feedback, develops autonomy and critical thinking while maintaining the teacher's leading role.

KEYWORDS

foreign language speaking skills, AI tools, stages of learning to speak using AI

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INTRODUCTION

The modern world is changing rapidly due to the advancement of new technologies, and artificial intelligence (AI) is at the forefront of this transformation. The UNESCO document "AI Competency Framework for Students" highlights the transformational potential of AI for society and emphasizes the importance of students' acquiring the values, knowledge, and skills necessary to use and co-create with AI in the educational process [1]. AI technologies have already revolutionized traditional pedagogy and are reported to be a key driving force in the transformation of the educational system, which is widely known today as Education 4.0 [2].

Decree of the President of the Russian Federation No. 490 has defined and formalized the strategy for AI development until 2030 in Russia. According to this Decree, relevant competencies have been integrated into the curricula of Russian universities since September 2021 [3]. Therefore, training of future professionals who are capable of meet the demands of the modern labor market, becomes particularly significant. Such professionals are expected to process large volumes of information using advanced technologies, respond promptly to global challenges, engage in lifelong learning, and demonstrate foreign language proficiency.

The current environment offers new opportunities for developing foreign language communication, enhancing its value and making it a necessary component of university students' professional training. In this context, the introduction of AI technologies into the process of teaching foreign language opens up broad prospects for developing foreign language communication skills.

Many studies point out that AI technologies offer a number of didactic properties and opportunities for teaching foreign languages. P.V. Sysoev and M.I. Ivchenko note that AI technologies provide users with instant feedback and implement personalized and individualized learning models [4, p.602]. S.V. Titova highlights the ability of AI technologies to create activities and assessments for the improvement of foreign language proficiency in the form of diverse multimedia content [5, p.29]. According to R. Godwin-Jones modern chatbots, especially those based on large language models, are capable of conducting open, multi-topic dialogues and adapting to the user [6].

J.R. Belda-Medina and Calvo-Ferrer note the ability of AI technologies to motivate students to learn a foreign language, which increases the interactivity of learning [7]. Therefore, AI is becoming an essential tool in the educational process at universities, making learning more flexible, adaptive, and accessible.

As S.V. Titova notes, citing Decree No. 490 of the President of the Russian Federation, today we can talk about AI-based technological solutions in foreign language teaching [5]. We consider this statement to be of a considerable value. However, there are some issues regarding the effective methodological implementation of AI tools in foreign language teaching. Furthermore, many educators are quite skeptical regarding AI-based educational products. One of the reasons for this skepticism is the gap between what teachers consider to be effective learning practices and what AI systems offer [8].

The purpose of the article is to substantiate the necessity and possibility of using AI-based services and tools to develop foreign language speaking skills in university students.

MATERIALS AND METHODS

The purpose of this study is to analyze the influence of AI tools on the development of ESL students' speaking skills among non-linguistic university students. The study involved 76 first-year students in the fields of Biotechnology and Biology from Vyatka State University (VyatSU). The research was conducted by the Department of Foreign Languages for Non-Linguistic Specialities.

To achieve the goal, the following research objectives were solved: 1) to analyze the potential of AI-based tools and neural networks (social and didactic) in developing ESL students' speaking skills; 2) to define the initial level of speaking skills in students of Biotechnology and Biology at VyatSU; 3) to develop a step-by-step methodology for enhancing ESL speaking skills using AI tools; 4) to conduct experimental training based on the proposed methodology; and 5) to analyze the obtained results of the experiment using methods of mathematical statistics.

To solve the research problems, the following methods were used: 1) theoretical analysis and synthesis of psychological, pedagogical, and methodological works on the problem of developing foreign language communication skills in students using AI tools; 2) experimental teaching aimed at improving students' speaking skills through AI tools; 3) observation of students' learning activities during English classes where AI tools were used; and 4) Pearson's chi-square test to determine changes between experimental and control groups, analysis and generalization of quantitative and qualitative research results.

The study examining an impact of modern AI and neural network tools on the development of students' foreign language communication skills was conducted during the second semester of the 2024-2025 academic year. The experimental teaching took place in the framework of the Foreign Language course where students studied English.

LITERATURE REVIEW

AI-based platforms, tools, and services have become a significant area of research due to the growing demand for efficient, personalized, and accessible tools for foreign language learning. AI development has transformed language education, making it interactive, adaptive, and autonomous [9]. Early AI applications focused on speech recognition and pronunciation correction, have been made into complex platforms integrating intelligent tutoring systems, chatbots, and generative AI models that provide real-time feedback and immersive practice. The practical significance of these technologies is highlighted by their potential to improve oral proficiency, reduce learners' anxiety, and support autonomous learning [10].

There are many modern research studies on using various chatbots in order to expand language practice and enhance students' communicative competence in the classroom and for self-study. P.V. Sysoyev and E.M. Filatov [11], L. K. Fryer et al. [12], and R. Hammad et al. [13] emphasize that most online agents are equipped with both speech input and output functions, allowing the shift from text-based to oral interaction. Advances in speech recognition technology, combined with the extended capabilities of mobile devices, are key factors underlying the use of chatbots as effective partners in language learning, though there are certain limitations of such technologies.

At the same time, L. Al Twijri et al. note that not only chatbots but also other AI tools can be integrated to guide and support learners in effective language learning and diagnosing their language problems [14, p.10]. Therefore, it makes sense to examine the implementation of various AI applications and platforms for building a language environment to ensure personalized learning. For this reason, we have turned to studies that explored the educational and methodological potential of AI-based platforms and tools for improving ESL speaking skills. Table 1 summarizes the results of the studies published over the last two years, reflecting diverse AI tools for developing speaking skills and their integration into the educational process.

Table 1 Overview of the studies on the use of AI tools in developing foreign language speaking skills

Study	AI Tool	Speaking Proficiency Improvement	Integration with Pedagogical Practices
E.Kim & J.Sim, 2024, [9]	Plang	Significant improvement in pronunciation, fewer pauses, and increased speaking confidence.	Part of extracurricular work; integration into lessons through group discussions.
R.M. Qassrawi et al., 2024, [15]	Google Assistant	Improvement in fluency, vocabulary expansion, and higher confidence in oral interaction through simulated dialogues.	In addition to English courses, homework, and projects.
W. Wiboolyasarin et al., 2025, [16]	AI-driven chatbots	Improvement in pronunciation, intonation, and fluency; reduced language barrier.	Extracurricular practice; role-plays, simulation of professional situations; exam preparation.

A.M.A. Mudawy, 2025, [17]	AI-powered conversational tools	Significant improvement in fluency, improved pronunciation, increased confidence, and motivation for speaking practice.	Extracurricular practice; flexible and accessible anytime without schedule restrictions.
N. Azzahra et al., 2024, [18]	Duolingo, ELSA Speak	Improvement in listening comprehension and fluency; vocabulary expansion, better understanding, and pronunciation.	Extracurricular practice; accessible anytime and anywhere, user-friendly interface.
E. Hidayatullah, 2024, [19]	Talkpal.AI	Noticeable improvement in fluency and speech clarity.	Additional tool; convenient dashboard with chat mode, flexible scheduling, and adaptive learning.
H. Rad, 2024, [20]	Speeko application	Significant improvement in speaking skills: fluency, pronunciation, confidence, and reduced language barrier.	A tool for an extracurricular practice.
J. Díaz & J. Rodríguez, 2025, [21]	SmallTalk2Me	Statistically significant improvement in speaking skills: pronunciation, fluency, grammar, and vocabulary.	Used as part of the learning process: promotes active student engagement.
D. Darmawansah et al., 2025, [22]	AI-GFCA (Generalization, Formulation, Correction, Appreciation)	Considerable improvement in pronunciation and fluency.	The AI-GFCA model integrates role-play tasks, script-writing, and peer error correction.
P. Poláková & B. Klímová, 2024, [23]	Chatbot	Significant improvement in language skills, especially in productive ones (speaking and writing).	An additional tool.
J. Fathi et al., 2024, [24]	Andy English Chatbot	Significant improvement in speaking skills, including fluency, pronunciation, grammatical accuracy, and vocabulary.	An additional tool.
D. Torkhani, 2025, [25]	Talkpal.AI	Significant improvement in fluency, pronunciation, vocabulary, and grammar.	An additional tool.

Summarizing the data in the table, it is clear that all the analyzed studies report significant improvements in foreign language speaking skills, including pronunciation, fluency, and confidence in using the language. Plang, Google Assistant, and AI-driven chatbots are particularly effective in reducing pauses in speech, improving intonation, and overcoming language barriers. Talkpal.AI and SmallTalk2Me demonstrate their effectiveness in training grammatical accuracy and lexical diversity. Duolingo and ELSA Speak were rated by researchers for accessibility, user-friendly interfaces, and improvement of listening skills along with speaking skills. AI tools were mainly used for extracurricular practice, accessible anytime and anywhere, offering flexible learning schedules. The main methods of integrating AI tools into the learning process included role-plays, simulated dialogues, homework assignments, and group discussions. Thus, AI tools significantly enhance foreign language speaking skills, promote students' engagement, and demonstrate flexibility and interactivity, making them valuable assets for modern language education. However, these studies did not aim to develop specific stages for integrating AI tools into foreign language teaching methodology. In our opinion, at the current stage of foreign language teaching, the development of a step-by-step methodology of using AI technologies in teaching speaking has become a pressing issue.

Both international and domestic education systems consider English speaking to be a means of developing professional communicative competence and a prerequisite for future specialists' successful professional activity. English as a foreign language is considered a key subject worldwide, as it provides learners with extensive opportunities to communicate and interact globally [26].

However, observations reveal that learners often lack English-speaking practice and motivation, have limited vocabulary, and show insufficient confidence in their communicative skills. At the lessons, students frequently demonstrate passive and reserved behavior, indicating a lack of interest in learning. It is crucial that learners develop a high level of self-confidence throughout the language learning process, especially in oral communication [27]. In this context, it is necessary to transform the educational paradigm by integrating AI technologies aimed at mastering foreign languages.

L. AlTwijri et al. note that the functionality of AI is inseparable from its integration into the educational environment: it offers numerous advantages and transforms traditional pedagogy into a more effective, individualized, and accessible model. AI systems are capable of adapting learning processes, materials, and pace to the specific needs of learners [14].

According to A. Yang, at the current stage of language education, foreign language teachers face the urgent need to adapt and innovate by using AI technologies to optimize teaching methods and enhance students' language skills [28, p.113]. In this regard, M.A.S. Khasawneh underlines that further comprehensive studies are required to understand the unique opportunities of virtual speaking partners for learners. It is essential to determine what benefits such tools bring to students when applied to improve speaking skills in terms of fluency, accuracy, vocabulary, cultural awareness, and overall linguistic competence [29].

The analysis of literature shows that certain didactic principles must be observed for the effective implementation of AI technologies in the educational environment.

A. Azamatova et al. highlight the following principles: 1) It is important to ensure the integration of the learning environment and learning content. Different forms of media and AI tools should correspond to the content of learning contexts in order to address various tasks. 2) The learning environment must correspond to learning objectives. Effective learning requires the use of tools that help achieve the set goals and accomplish learning tasks. 3) The learning environment should correspond to learners' cognitive characteristics and needs [30].

A. Yang also emphasizes another essential didactic principle for integrating AI technologies into the learning environment – effective human-machine interaction. It means that teachers must gain a comprehensive understanding of AI tools' functions and features. This includes awareness of their capabilities in language processing, data analysis, and machine translation [28].

Therefore, it is necessary to further investigate the methodology of applying AI technologies in foreign language teaching and strengthen the integration of new technologies into language learning.

RESULTS

Ascertaining stage

At the ascertaining stage of the experiment, first-year students enrolled in the programs 19.03.01 Biotechnology and 06.03.01 Biology, Vyatka State University had an entry diagnostic test. The experiment involved both an experimental and a control groups, with a total of 76 students. The purpose of this entry diagnostic assessment was to identify the initial level of English speaking skills within the course Foreign Language, using a diagnostic test. This test was in the form of oral interaction, specifically a role-play activity, where students were required to discuss and prepare a short project on the topic "Modern Biology and Biotechnology: Revolutionizing Science and Society". Role-play activities allow to reproduce natural communication conditions and assess students' foreign language skills. In addition to vocabulary, grammar, and pronunciation skills, we used more criteria that are essential for students' future professional activities. To evaluate the initial level of English speaking skills, we adapted the descriptors of the following CEFR scales: 1) General linguistic range – the ability to use the language flexibly in different contexts, from everyday communication to professional discussion; 2) Goal-oriented co-operation – basic strategy of interaction in collaborative learning and work, which is an everyday phenomenon in real life, especially in professional contexts [31]; 3) Overall oral interaction – the ability to engage in dialogue, negotiations, and presentations. We consider that the choice of these scales corresponds to the aims and objectives of teaching foreign languages to first-year students of non-linguistic majors and provides an investment in their future competitiveness as university graduates. The adapted descriptors of students' speaking levels in a foreign language are presented in Table 2.

Students' speaking skills during role-play were assessed on a points scale. The maximum possible score was 15. Based on the adapted descriptors, the criteria included vocabulary (max. 3 points), grammar (max. 3 points), pronunciation (max. 3 points), overall oral interaction skills (max. 3 points), and goal-oriented cooperation skills (max. 3 points). Depending on the score, the following

levels were defined: 11-15 points – a high level; 6-10 points – an average level; 0-5 points – a low level. The results of the ascertaining stage are presented in Table 3.

Table 2 Descriptors of students' English-speaking skills in levels

Low	Average	High
Limited vocabulary (basic everyday topics: family, studies, shopping). Frequent use of memorized phrases. Simple structures (Present Simple, elementary questions), frequent errors, simplified sentences. Strong accent, pronunciation not always intelligible. Slow pace, many pauses. Can have a very short dialogue with help from the interlocutor (e.g., introducing oneself, asking for directions). Can participate in very simple joint activities with clear instructions. Understands basic commands but often needs repetition/simplification.	Sufficient vocabulary for familiar topics (hobbies, plans, simple discussions). Sometimes has difficulties with finding words. Uses basic tenses (Past, Future), though with errors. Complex sentences are rare. The accent is noticeable, but overall speech is understandable. Medium pace, occasional pauses for word search. Can conduct a dialogue, ask questions, and express opinions, though sometimes requires clarification. Can take part in simple project discussions. Able to propose ideas and understand others' arguments. Occasionally requires clarification of instructions.	Extensive vocabulary, including abstract concepts. Can paraphrase when lacking words. Uses complex structures (conditionals, passive), with rare errors that do not hinder understanding. Clear pronunciation, minor accent. Fluent pace, natural intonation. Can easily maintain a conversation, argue a position, and adapt to the interlocutor's style. Can lead discussions, argue viewpoints, understand, and consider multiple perspectives. Adapts communication style to the situation flexibly.

Table 3 The initial level of students' English speaking skills

Number of students	Experimental group					
	Low		High		Average	
	abs.	%	abs.	%	abs.	%
38	17	44,7	16	42,2	5	13,1
	Control group					
	Low		High		Average	
	abs.	%	abs.	%	abs.	%
38	19	50	13	34,2	6	15,8

The data in Table 3 show that before experimental training, all students did the role-play task and demonstrated almost similar distributions in speaking skill levels. The ascertaining stage revealed that a significant part of the students had low and average levels of foreign language speaking proficiency. The highest scores were obtained in vocabulary and grammar; however, students mainly used basic tenses, avoiding more complex grammatical structures. The role-play showed that most students experienced considerable difficulties in discussing project details, adapting to the interlocutor's style, and expressing their point of view. Therefore, the ascertaining stage confirmed that students' English speaking skills that are necessary for their future professional activity were insufficiently developed. Thus, the ascertaining experiment demonstrated the need to incorporate innovative AI technologies into the learning process so that students' learning outcomes meet the modern requirements of future specialists professional training.

Formative stage

The purpose of the formative stage was to develop students' English speaking skills within the course "Foreign Language". At the formative stage of the experiment, students of the experimental group studied topics according to the university's program. The didactic conditions included

using AI platforms and tools and a methodologically designed step-by-step program for teaching speaking with AI integration. The objectives of the formative stage were to raise students' speaking proficiency, teach them to use various AI tools for autonomous language practice, and motivate them to speak English on different topics, including professional ones. Students were taught in classrooms, online, and through extracurricular practice. The training course lasted 8 weeks (2 academic hours per week + 3–4 hours of extracurricular work). The experimental training using AI tools was divided into 6 consecutive stages.

The goals of stage 1 were to introduce AI tools for teaching and practicing speaking to students: ChatGPT, DeepL, Speechify, Grammarly, Elsa Speak, and Otter.ai, and to develop basic vocabulary on the topic "Science in English: Why Speaking Matters." Students had to record a one-minute audio "Why I study Biology/Biotechnology," upload it to Otter.ai for transcription, and analyze the transcription to identify errors in vocabulary, grammar, and phonetics. Test results were then discussed in an online lesson, and each student created a Personal Development Plan for their speaking skills for the experimental training period.

The goals of stage 2 were to increase professional vocabulary using Quizlet and Anki, develop speaking skills on the topic "Key Terms in My Field", and practice speaking using written sentences as a basis. During the lesson, students had to make up simple sentences with each term using ChatGPT, use Youglish / Reverso Context to find examples of how words are used in context and write a draft answer (at least 10 sentences) on the topic "My Favorite Biological Process" (e.g., photosynthesis, cell division), following the outline: What is it? How does it work? Why is it important? Using Perplexity.ai or ChatGPT students found a simple explanation of these processes in English, checked the drafts in Grammarly and DeepL Write, recorded a 2-minute audio monologue, after which the teacher provided feedback to the students on the structure and content of their answers. As an additional assignment, they had to upload the recording to Speak.com or Youglish.ai for analysis of speed, pauses, and vocabulary.

The goals of stage 3, "My Mini Research Project," were to introduce Canva and Gamma.app tools to students, develop their presentation skills, and learn how to make a structured oral presentation. During the lesson "The Biotech Innovation I Like," students had to make a 4-slide presentation in Canva or Gamma.app with AI-powered content generation in English and prepare a 3-minute presentation. Their homework was to record a video and analyze the presentation's structure, vocabulary, and grammar using Yoodli.ai. Then, at the online lesson, there were students' mini presentation defense, where the students answered questions about the presentations, and received feedback from the teacher and classmates.

Stage 4, "Roleplay with AI," was focused on developing dialogue-speaking skills on the topic "Scientific Conversations." During the lesson, students were introduced to the applications Character.AI and Replika, which provide interactive experiences with virtual characters. Students had to conduct three dialogues with an AI interlocutor, each one lasting from 3 to 5 minutes. Dialogues with virtual characters covered the topics "Asking for help in the lab" and "Explaining your research to a colleague." The third dialogue was an interview with an AI recruiter in English. The AI asked questions like "Why should we hire you?" or "Tell me about a time when you overcame a challenge". For independent work, students had to practice with Interview Warmup (Google) or Yoodli.ai – interview simulators, record a dialogue with an AI bot using Otter.ai or Talkio AI, write down a brief analysis of their mistakes, and note improvements in their Personal Development Plan. The online lesson then included role-playing games in pairs: "A Lab Partner" and "Conference Q&A". Then, the teacher analyzed a role-playing game and provided feedback to the students.

Next stage 5, "Debating Science: Pros and Cons," was aimed at developing scientific debate skills, argumentation, and critical thinking in English on the topic "Is genetic editing in humans ethical?" During the lesson, students had to find pros and cons using ChatGPT or Perplexity and prepare a 2-minute monologue with those arguments. Then they had to upload their monologues to Otter.ai for transcription and analyze the transcriptions, find errors in vocabulary, grammar, and phonetics, and analyze and revise their arguments using Yoodli.ai. After this, the teacher organized a debate

on the topic, where students practiced a scientific dialogue, using phrases like "I agree because...", "One drawback is...", "From a scientific point of view..." asking questions, expressing opinions, and requesting clarification of what was said. During an online lesson, there was a debate on the topic "Is genetic editing in humans ethical?" where students demonstrated their discussion skills and received feedback from the teacher. At the same stage, a discussion was held on the topic "Lab Meeting," where students were divided into several groups of 3-4 people to discuss the topic "Planning a new CRISPR-based experiment." Each group received a "lab meeting" scenario with the following roles: a lead researcher, a lab technician, a graduate student, an external collaborator. ChatGPT and Gemini were used to help students prepare for the role, expand their vocabulary, and generate ideas. The request to the AI included to propose 2 questions for their role and one suggestion for discussion in a group. Students were required to use professional vocabulary, ask clarifying questions, express opinions, and propose solutions. The polylogue lasted 5–7 minutes per group.

The final stage 6 of the experiment included a demonstration of students' progress in speaking English and reflection. Students had to prepare a 5-6-minute final presentation on the topic "How I See Myself as a Future Biotechnologist/Biologist: Challenges and Goals." The presentation included the students' personal experiences, their research interests, the role of English in their future professional activities, and their plans for the future. During preparation, students had to record a video and analyze it using Yoodli.ai and Elsa Speak. Final presentations were online, then students received feedback from the teacher and their classmates. As part of their reflection, students answered the questions "What did I learn? What will I continue to learn?" using the Personal Development Plan. In addition, reflection included questions such as "What activities were the most useful for your speaking skills?", "What professional vocabulary was challenging?", and "How can you apply these skills in your future studies?"

Control stage

Following the experimental course of teaching students using artificial intelligence tools, a re-assessment of students' English speaking skills was conducted. The results of the control experiment are presented in Table 4.

Table 4 The achieved level of students' English speaking skills

Number of students	Experimental group					
	Low		Medium		High	
	abs.	%	abs.	%	abs.	%
38	2	5,3	16	42,1	20	52,6
	Control group					
	Low		Medium		High	
	abs.	%	abs.	%	abs.	%
38	13	34,2	14	36,9	11	28,9

A comparison of the results of the ascertaining and control experiments indicates an increase in the development of English speaking skills in all students, despite the fact that the control group did not undergo experimental training. The proportion of students in the experimental group with a low level of speaking skills decreased significantly from 44.7% to 5.3%, while the number of students with an average level remained almost the same – 42.2% and 42.1%. The number of students with a high level increased significantly from 13.1% to 52.6%. In the control group, the number of students with a low level of speaking skills decreased from 50% to 34.2%, while the number of students with an average level increased slightly from 34.2% to 36.9%. The number of students with a high level increased from 15.8% to 28.9%.

The obtained data show that there are statistically significant differences between the experimental group and the control group at the ascertaining stage and at the control stage of the experiment, which is confirmed by Pearson's chi-square test, which can be found using a calculator [32].

The critical values of the χ^2 statistic at the significance level of $\alpha=0,05$ and $\alpha=0,01$ are $\chi^2_{cr} = 5,99$ and $\chi^2_{cr} = 9,21$ respectively. At the beginning of the experiment, the calculated value of the statistic was $\chi^2_{emp} = 4,97$, which does not exceed the critical values, and at the end of the experiment $\chi^2_{emp} = 7,73$, which is higher than the critical value at $\alpha=0,05$. This allows us to state with a probability of at least 95% that at the beginning of the experiment, the control and experimental groups were statistically indistinguishable in terms of the level of the English speaking skills development, while at the end of the experiment these differences became significant. In addition, a comparison of the indicators within the control group at the beginning and at the end of the experiment showed $\chi^2_{contr} = 1,02$, which indicates insignificant changes in the development of English speaking skills. In the experimental group, $\chi^2_{exp} = 17,22$, indicating significant changes in the studied parameters. These calculations demonstrate the effectiveness of the proposed methodology.

The results of the experiment have shown that over the course of the semester, students significantly improved their foreign language skills using artificial intelligence tools, reaching a statistically significant level.

DISCUSSION

The data obtained during the study allowed us to draw several conclusions for scientific discussion. The use of a complex of AI tools with a developed step-by-step methodology aimed at developing foreign language speaking skills is an important and effective component of the educational process at university. The proposed method of using AI tools to develop foreign language speaking skills facilitates the gradual development of oral communication, from basic vocabulary to academic and professional communicative situations. A gradual increase in the complexity of speech and cognitive tasks ensures the systematic development of foreign language speaking skills. When each student works at an individual pace, receives immediate feedback, and independently analyzes their mistakes, it develops autonomous learning skills and increases responsibility for their own progress. Thus, AI tools effectively support student-centered learning, especially in settings with limited access to native speakers or a teacher. AI tools such as Yoodli.ai, Elsa Speak, and Otter.ai provide objective data on speech rate, number of pauses, phonetic accuracy, lexical diversity, and grammatical errors. This analysis helps students monitor progress, set specific goals within their Personal Development Plan, and develop metacognitive skills. Role-playing games and simulations of real professional situations enhance motivation and knowledge applicability, while professionally oriented communication tasks increase students' motivation and ensure knowledge transfer to future careers. Furthermore, the presented methodology for developing foreign language speaking skills provides multi-level and combined feedback: automated AI feedback, self-assessment through transcription and video analysis, group feedback from classmates, and expert feedback from a teacher. This feedback facilitates a more comprehensive and objective development of foreign language speaking skills.

It is obvious, that using the proposed methodology, technological literacy becomes an integral part of a language learning. As A.A. Kytmanov et al. notes, this applies in particular to the digital competence and culture of a teacher [33]. Working with AI tools develops not only linguistic but also digital competencies essential in the modern academic environment for both students and teachers. It is important that AI tools help create relevant educational material, as the material in published textbooks becomes outdated very quickly, especially in natural sciences.

Furthermore, we have found that AI tools served three functions in foreign language speaking classrooms: as teaching assistants, personal tutors, and learning partners, allowing students to receive more effective and personalized learning. This is supported by the findings of L. AlTwijri et al. [14]. Our findings are consistent with those of L. Kohnke et al. [34] that integrating AI tools into foreign language teaching provides significant pedagogical benefits, particularly by increasing the availability and frequency of language practice. Following H. Qiao and A. Zhao [35], we have found that real-time feedback on pronunciation, intonation, and grammatical accuracy provided by AI applications supports autonomous learning and accelerates fluency development.

Our findings are consistent with the research findings of S. Deshpande, S. Akdilek, S. [36,37] that, despite these technological advances, AI remains limited in reproducing subtle aspects of human communication, such as empathy, contextual awareness, and non-verbal cues that are essential in academic and professional discourse. Furthermore, overreliance on AI may also lead to superficial language acquisition, as learners may reproduce AI-generated phrases without a deep understanding, potentially undermining the development of critical thinking and spontaneous expression of thoughts in a foreign language. In this regard, following G.J. Hwang et al. [38], we have concluded that the most effective approach appears to be a model of teaching foreign language speaking skills, where AI serves as an additional tool for active practice and feedback, while the teacher facilitates meaningful interaction, guides critical discussion, and promotes the development of deeper communicative competence. Thus, methods for developing foreign language speaking skills should be balanced so that AI tools enhance, rather than replace, the teacher's role. The study has confirmed the idea of E. Nikonov et al. that the impact of new digital technologies on the education system extends beyond didactics. Their use blurs the boundaries between the formally organized learning environment in the classroom and the opportunity to learn at a convenient time and place outside the classroom [39].

CONCLUSION

AI tools currently offer teachers and students various opportunities to develop foreign language speaking skills and improve oral proficiency during the learning process. Our study presents an approach to developing foreign language speaking skills that uses cutting-edge technologies – artificial intelligence tools. The proposed methodology represents a modern, technologically advanced, and pedagogically sound model for developing foreign language speaking skills. The key pedagogical conditions for such training are: 1) sequencing – structuring the process of developing foreign language speaking skills into successive stages, 2) technological AI support – targeted integration of a set of AI tools into each stage of training for diagnostics, practice, feedback, motivation, and autonomous development of speaking skills, 3) techno-pedagogical competence – a teacher's technological literacy and digital competencies used in teaching practice, 4) professional focus – organizing the development of foreign language speaking skills in the context of professional communication, 5) guided independent learning – a combination of independent student work and interaction under the guidance of a teacher, 6) multi-level feedback – automated AI feedback, self-assessment through transcription and video analysis, group feedback from classmates, and expert feedback from a teacher, 7) reflection – developing students' reflection and self-regulation skills through maintaining a personal development plan and regular analysis of progress in speaking. The proposed approach to developing foreign language speaking skills opens up prospects for transforming traditional models of teaching foreign languages at university towards more personalized, technologically enriched, and professionally relevant learning.

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