

**UDC 378.4**

**IRSTI 14.35.09**

<https://doi.org/10.48371/PEDS.2026.81.2.007>

## **ARTIFICIAL INTELLIGENCE ASSISTANTS IN MASTERING PROFESSIONAL TECHNICAL TERMINOLOGY**

\*Zhubanova Sh.A.<sup>1</sup>, Kozhakhmetova Z.Zh.<sup>2</sup>,

Dzhusubaliyeva D.M.<sup>3</sup>, Smagulova S.S.<sup>4</sup>

\*<sup>1,2</sup>KBTU, Almaty, Kazakhstan

<sup>3</sup>Ablai Khan KazUIRandWL, Almaty, Kazakhstan

<sup>4</sup>A. Myrzakhmetov Kokshetau University, Kokshetau, Kazakhstan

**Abstract.** The article explores the potential of artificial intelligence-based tutors to improve foreign language proficiency in the technical university context, with a particular focus on students' acquisition of professional terminology. The researchers have used a flipped learning that combines artificial intelligence-based tutors with traditional classroom instruction, to facilitate the learning of complex technical concepts. Understanding these concepts is essential for effective communication, comprehension, and professional success. Combining artificial intelligence tutors with human teachers maximizes the benefits of both approaches. The literature review reveals the advantages and limitations of artificial intelligence instructors in language learning. Data quality and ethical considerations are also paramount as AI tutors deliver a personalized learning experience and keep students engaged.

Additionally, research shows the importance of interpersonal relationships in developing communication skills. The preparation process to study professional terminology with emerging technology in 'flipped learning' environment includes five key components: diagnosis, strategic goals, content and internal organization, and evaluation. To collect data, the researchers have used a mixed strategy that included a survey (60 students) and teachers' interview (30 professors). This study was prepared to provide information about the progressive and effective education system at Kazakh British Technical University by understanding the expectations and limitations of artificial intelligence tutors, ensuring that students of technical specialties gain the language skills necessary to succeed in the global world.

**Keywords:** foreign language teaching, flipped learning, traditional teaching, AI tutors, professional terminology, technical university, language competence, teaching methodology

### **Introduction**

Regarding Kazakhstan's technological growth, artificial intelligence (AI) is a disruptive catalyst, possessing tremendous transformative potential in both business and academic fields. According to Bluescreen (2022), 86 startup projects have been launched in Kazakhstan across 13 different fields, including online educational platforms, immersion technologies, data science, artificial

intelligence, machine learning, robotics, learning management systems, and others. In 2020, this initiative helped position Kazakhstani EdTech startups on the global map in the Holon IQ ranking. While the country has developed expertise in AI applications, especially within education, the technology is still in its early developmental stages, indicating significant room for further advancement and integration.

Our research focuses on AI-based tutors in foreign language education to assist students in learning professional terminology in English. Nguyen (2023) emphasizes that the role of artificial intelligence in education encompasses various aspects, including approaches related to “guidance,” “students,” and “teachers,” thereby supporting the integration of AI tools such as our proposed tutors to enhance language learning outcomes. “Guidance” AI assists with decision-making by offering instructor recommendations and identifying at-risk students, whereas “student” AI focuses on learning enhancement through intelligent tutoring systems and game-based learning. “Teacher” AI supports educators by providing features like automated essay grading and real-time progress monitoring.

The use of AI in educational settings needs to address privacy concerns, comply with regulations and guidelines, adhere to educational principles, improve digital literacy, demonstrate trustworthiness, and effectively manage processes and expenses. The study focused on the successful acquisition of professional terminology in English within technical university settings, with the understanding that incorporating AI can enhance students’ learning experiences by providing personalized and efficient support. This research is inspired by a global perspective, referencing Grigule et al. (2023), who emphasize the importance of specific terminology in education, including its historical, social, and cultural contexts, to foster comprehensive understanding. Following the worldwide trend of intensive foreign language instruction within university education (Valeyeva, 2019), the study aims to address the inadequate proficiency in professional foreign language terminology among technical university graduates. Valeyeva’s (2019) multidisciplinary approach, which integrates project-based and student-centered teaching methodologies, reflects the dynamic and evolving nature of learning required in today’s technologically driven world. Current research supports the ongoing development of projects that incorporate artificial intelligence-based tutors into technical universities, with the goal of improving students’ proficiency in both language and technical knowledge, thereby preparing them more effectively for professional challenges.

One of the critical issues stopping tech graduates from getting international jobs is that they don’t have a strong knowledge of professional English terms. The most common English proficiency level of Kazakhstan engineering students is intermediate (B1–B2); however, they often struggle to apply specific technical terms in real-world professional situations. Moreover, while people have studied how AI helps with general language learning, there hasn’t been much focus on how it actually improves technical vocabulary. This highlights a research gap: we need more evidence-based studies on using AI specifically for terminology training in technical universities.

*Transforming technical language learning*

The changing landscape of the professional world requires employees with specialized knowledge. Mastering the complexities specific to a particular topic is essential for effective communication, understanding, and ultimately, success. In today's ever-evolving world, artificial intelligence (AI) has become a valuable ally for those striving to master professional technical language.

The ability of AI tutors to customize learning experiences is a significant advantage (Sumakul et al., 2022). Unlike traditional one-size-fits-all technology, AI can tailor guidance to a person's strengths and weaknesses. This teaching method can be effective when dealing with difficult technical terms. Furthermore, AI-assisted tutors can promote greater engagement with the topic (Rusmiyanto et al., 2023) by incorporating interactive elements such as simulations and games, turning the often boring process of memorizing technical phrases into an enjoyable experience. This aligns with Schmidt and Strasser's (2022) vision of artificial intelligence as a transformative force in language learning, especially when it creates an increasingly dynamic learning environment. However, the quality and scope of basic knowledge are very important for the work of artificial intelligence (AI) tutors (Akinwalere & Ivanov, 2022). To teach the lesson successfully, AI tutors need access to a large database of specific words that include not only the meanings but also examples of usage in context.

The ethical implications of AI instructors are also deserve significant consideration (Popenici & Kerr, 2017). There are concerns about the possibility of algorithmic bias, which occurs when AI systems reinforce existing biases in data collection. Consider an AI tutor who is trained mostly according to instructions written by a specific group of people. This may lead to the exclusion of other words used by certain industries. Careful data selection and algorithm development should be considered to ensure AI tutors support diversity and represent the range of professional languages used in the discipline.

While AI tutors have tremendous promise as learning tools, they should not be viewed as a replacement for human instructors. Alharbi (2023) emphasizes the significance of using a pedagogical approach while employing AI-powered products. Human teachers can better provide personalized guidance and develop students' critical thinking skills that AI can not implement. Kasimi and Fidan (2023) highlight the role of interpersonal communication in foreign language contexts by emphasizing the importance of discussion and debate that goes beyond the memorization of technical words. However, the use of artificial intelligence for speaking practice opens up new ways to learn certain contexts (Mahmoud, 2022). Consider engaging in technical interactions with a virtual client or colleague, as these interactive simulations can provide a safe environment to practice communication and gain confidence before entering the real workplace.

AI tutors offer a promising new approach to overcoming the challenges of effective technical terminology learning. They provide significant benefits to the educational process because they can create personalized learning, encourage engagement, and provide a positive learning environment. However, it is important to recognize that AI has its limitations, especially when it comes

to knowledge acquisition and ethical considerations. Finally, when AI tutors are used in conjunction with human teachers, a blended learning environment can be created that maximizes the benefits of human contact and technological innovation, harnessing AI’s unimaginable potential to transform the way we learn technical content and empower students as we progress.

By the analysis of literature, the majority of international studies concentrate on AI in the role of a grammar correction tool, pronunciation, and communication proficiency. Nevertheless, according to the discipline-specific programs, insufficient attention is given to the organized development of restrictively specialized technical terms. Since domestic research predominantly examines digital conversion abstractly, it has insufficient observational relational information. Moreover, the study at hand is facilitated by including both theoretical analysis and the growth in professional technical university vocabulary. At the national level, methodological aspects of professionally oriented foreign language instruction have been widely discussed by scholars of Ablai Khan Kazakh University of International Relations and World Languages. For instance, Dzhusubaliyeva (2021) emphasizes the importance of integrating digital technologies into competence-based language instruction, particularly in the development of discipline-specific terminology. The author highlights that technological tools should support structured vocabulary acquisition rather than replace pedagogical guidance.

*Theoretical framework*

Our study proposes a theoretical framework (Fig.1) for improving English proficiency in the technical university context, focusing on students’ career preparation for their core discipline “Maritime Terminology”.

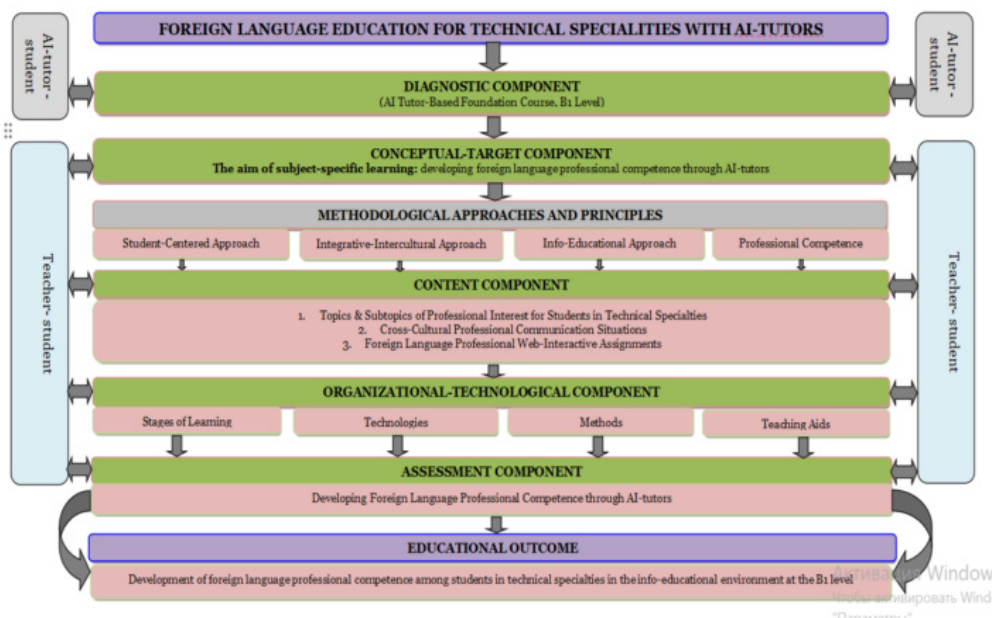


Figure 1- Framework: FLE for technical specialties with AI-tutors

This framework uses artificial intelligence (AI) tutors to help students learn professional terminology and consists of five main components: a diagnostic component, a conceptual-target component, a content component, an organizational-technological component, and an assessment component.

Newly enrolled students begin their journey with a *diagnostic component* provided by an artificial intelligence tutoring system that examines their English proficiency using the Common European Framework of Reference (CEFR), places them in appropriate groups for future study, and, unlike traditional placement tests, eliminates teacher bias and promotes transparency in assessment (Fig. 2).

The screenshot displays two side-by-side lesson cards from the AI-Step Course. Both cards feature a male AI tutor avatar and the KBTU Kazakh-British Technical University logo. The left card is titled "Past habits" and "Used to / be used to / get used to". It lists two bullet points: "Habits in the past" and "Repeated actions in the past". The right card is titled "Adjectives ending in '-ing' and '-ed'" and includes a question: "Do you know the difference between 'bored' and 'boring'?". It provides two examples: "My friend is bored. - (My friend feels bored)" and "My friend is boring. - (My friend is a boring person)".

Figure 2- AI-Step Course

This self-paced learning course is designed to be accessible to all students, regardless of location. This course, taught by an AI-assisted tutor, covers 26 topics, with each weekly session lasting 90 minutes. AI-Step course reinforces grammar concepts, builds vocabulary, and assesses student understanding through regular subject assessments. These assessments have been carefully designed to take into account the CEFR levels (it ranges from A1-C1), allowing newly enrolled students to develop and repeat their language skills beyond their secondary school experience. By following this approach, students gain the basic English language skills they need for higher education. This course provides a solid foundation for learning English, paving the way for learning more English in their chosen career.

*The conceptual-target component* considers blended approach, combining traditional classroom instruction with AI-assisted tutors. Traditional classroom instruction always provides a foundation for language and technical knowledge through lectures, discussions, and supervised practice. On the other hand, AI-assisted tutors offer personalized assistance and focus on targeted practice for students working independently on projects and assignments.

AI-assisted tutors can enhance learning by providing clear and comprehensive explanations of complex technical concepts. This supports students in understanding not only the terminology and sentence structures but also their nuanced applications in professional contexts. Consequently, students can develop the ability to produce clear, concise, and effective communication. This process broadens their knowledge and allows them to practice their newly acquired language skills in realistic settings, thereby improving their overall communication competence. AI tutoring system is more than just additional

resource in educational process, designed to help students work independently and create projects on specific technical topics. This personalized approach goes beyond general language instruction to provide students with the specific knowledge they need to succeed. AI tutors act as virtual mentors, guiding students through the research and communication skills needed to complete a project.

*The conceptual-target component* focuses on four fundamental methodological approaches that promote effective discipline learning: 1) *The student-centered approach* emphasizes tailoring the learning process to students' needs and interests, thereby promoting autonomous and collaborative language development through active engagement; 2) *The integrative-intercultural approach* addresses the cultural factors that affect the student's career choices and provides a better understanding of how the language is used in daily life; 3) *The info-educational approach* that combines digital literacy with language learning enables students to acquire professional knowledge while also developing the skills to critically evaluate the quality and significance of the information they encounter; 4) *The professional competence* approach emphasizes the development of specialized language skills essential for effective academic and professional performance, recognizing that successful communication extends beyond basic language proficiency to include context-specific competencies required for career success. In line with this perspective, Sarsembayeva (2020) argues that professionally oriented foreign language teaching in non-linguistic universities must ensure the gradual formation of terminological competence through contextualized tasks and authentic communication models. This approach corresponds to the blended learning structure implemented in the present study.

*The content component* encompasses a broad array of topics pertinent to students' career paths, presenting foundational knowledge through classroom lectures and reinforcing it with AI-assisted personalized practice, while also emphasizing real-world applications and communication skills essential for their future professions. The lectures, which cover topics developing discipline-specific knowledge and technical language, are accessed by students via AI-assisted tutors. This allows extra time for participatory activities throughout class, which is quite valuable. Via a range of interactive assignments, class time is devoted to encouraging active learning. Finally, students present their work consisting of research projects, monologues, dialogues, interactive presentations, maps, and different types of diagrams in the classes after AI-assisted instructions. These presentations allow students to practice their newly acquired skills. Students work with AI tutors in the form of blended learning (watching lectures out-of-class and discussing project instructions in the class). Face-to-face interaction with teachers provides individualized feedback and guidance throughout the learning process to ensure students stay on track and problems are resolved. The study was analyzed by applying the Common European Framework of Reference for Languages (CEFR), ensuring that assessments are aligned with students' language proficiency levels (A1-C1) and accurately reflect their linguistic development.

*The organizational technological component* includes four basic elements that work together to provide effective learning: 1) *stages of learning*- a series

of carefully planned steps guides students through various levels of technical language comprehension and independent learning; 2) *technologies* refers to the wide range of tools and resources used in the classroom to support active learning, adaptive learning, and independent learning. Resources include whiteboards, textbooks, and simulations, as well as effective methods such as technical skills training, virtual reality testing, and web-interactive assignments; 3) *methods* encourage student engagement and learning goals through a variety of practical techniques: virtual field trips, content games, role-playing simulations, case studies, repetitive exercises, and collaborative learning; 4) *teaching aids*- a set of flashcards, multimedia presentations with integrated audio and video, and flexible and accessible online learning environments.

*The assessment component* of the curriculum aligns with the Council of Europe's B1 level CEFR descriptors, enabling the measurement and evaluation of students' language skills development (Tab. 1).

Table 1. B1 level CEFR descriptors for learning professional terminology

<i>Skill</i>	<i>Descriptors</i>
Reading	<ul style="list-style-type: none"> <li>- Understands main ideas and specific information in simple job-related documents (reports, instructions).</li> <li>- Extracts key information from texts related to their professional field (product descriptions, services).</li> </ul>
Speaking	<ul style="list-style-type: none"> <li>- Engages in simple, routine work-related negotiations and discussions.</li> <li>- Expresses opinions, describes problems, and proposes solutions on professional matters.</li> <li>- Uses basic professional terminology to explain and discuss their job and responsibilities.</li> </ul>
Writing	<ul style="list-style-type: none"> <li>- Writes simple business letters, emails, notes, and reports using basic professional vocabulary.</li> <li>- Composes brief messages and instructions relevant to their professional area.</li> </ul>
Listening	<ul style="list-style-type: none"> <li>- Understands the main points of simple, clearly articulated spoken messages and instructions at work.</li> <li>- Follows the gist of discussions on professional topics when the speech is clear and standard.</li> </ul>

This table provides a clear connection between the assessment criteria and the expected learning outcomes for B1-level students, ensuring a targeted and effective evaluation process. Students at the B1 level should be able to actively participate in discussions on professional topics they are familiar with and demonstrate that they have understood the main concepts in factual material. This entails formulating succinct and understandable explanations, speaking up on specialized matters within their subject of study, and participating actively in discussions about their assignments.

The suggested framework, which focuses on AI-assisted tutors, a structured curriculum, and a variety of methodological approaches, provides students with critical English language and communication skills by emphasizing both fundamental language development and industry-specific terminology. This

framework enables students to not only navigate technical information but also actively participate in professional communication in the maritime field.

## **Materials and methods**

### *Research design*

Our study aims to investigate the impact of integrating AI-assisted tutors into a foreign language education (FLE) for technical students. The curriculum was designed using a two-pronged approach: traditional face-to-face classes with teachers that provide foundational language and technical skill development, complemented by AI-based tutors that support independent learning. The independent project involves producing work in multiple formats, such as projects, monologues, dialogues, interactive presentations, maps, sketches, and diagrams, which students then present to the class according to specific guidelines for each project type.

The usefulness of the instructional model was assessed via quantitative parameters:

1. development in specialized vocabulary identification;
2. precision in the use of terminology during oral presentations
3. progress in grammar competence in AI-supported assessments
4. enhancement of students' self-reported assurance in technical communication

### *AI-assisted tutors for teaching professional terminology*

These AI-assisted tutors were made possible primarily through HeyGen, an AI platform designed to support educators with advanced AI capabilities. According to Warner (2025), AI tutors, also known as AI teachers, act as digital assistants. They mimic human-like interactions in video presentations, bringing excitement and dynamism to online education. Teachers can create engaging AI clones without coding knowledge by submitting their photos or selecting from a collection of avatars to generate customized educational videos. HeyGen offers text-to-speech capabilities with multiple voices and languages, allowing teachers to customize the AI instructor's teaching to meet students' individual needs. The key feature of HeyGen is that it can record the conversations of AI teachers to ensure that they are covering subject-based topics and essential terminology specifically relevant to students. The AI-assisted tutor is designed to resemble a human instructor, including facial expressions, body language, and speech characteristics (Fig. 3).

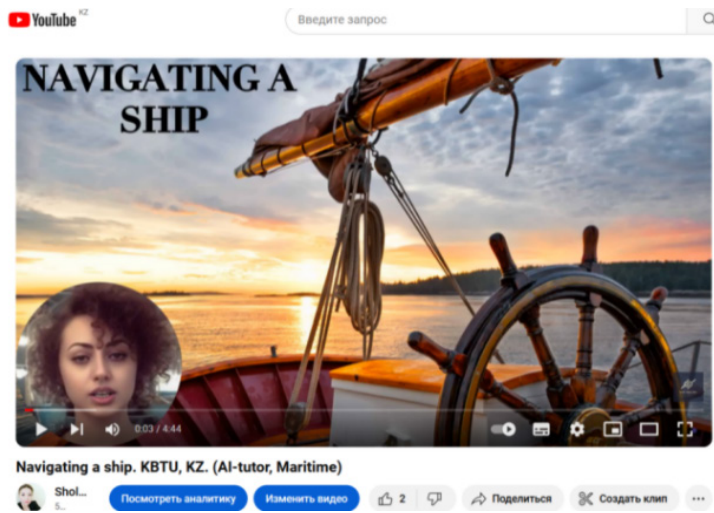


Figure 3-Professional terminology taught by AI tutor

Users can select AI tutors that communicate in different varieties of English, such as British, American, and Canadian English, and share diverse types of content, including text, music, and images, which can be viewed as multimedia presentations. Utilizing the flipped classroom approach, students independently review AI-generated video lessons at home, assess the content, and develop individualized project strategies. These projects are designed to simulate real-world environments and cultivate professional communication skills. Students engage in dialogue practice, public speaking exercises, and interactive presentations aimed at acquiring new technical vocabulary. The AI-produced videos contain exclusive content that introduces specific phrases, words, and sentences relevant to the topic. Under the flipped classroom model, students present their work during class sessions. The program's effectiveness is evaluated through a prioritization process to ensure that students meet all learning objectives. To assess their understanding of the terminology introduced by the AI tutors, students participate in quizzes and interactive games (such as JeopardyLab, Spinner, Kahoot, Microsoft Forms, and Google Forms), which are integrated into the assessment framework.

#### *Study group*

The experiment included 63 first-year university students enrolled in maritime programs. The experimental group comprised 30 deck cadets who received training with AI-assisted tutors, while the control group consisted of 33 cadets pursuing engineering studies who completed standard coursework without AI integration.

#### *Data collection tools*

A survey was conducted with the participation of 63 respondents to investigate the use of artificial intelligence in foreign language instruction. The survey was administered via the SimPoll website (<https://simpoll.ru/run/survey/5880a6d4>) and comprised ten questions, nine of which were multiple-

choice items designed to capture respondents’ opinions. Additionally, structured interviews were conducted with 30 faculty members from the Department of English within the School of Social Sciences at Kazakh British Technical University to explore the perceived advantages and disadvantages of integrating artificial intelligence into teaching practices. This combination of quantitative and qualitative data provided students and teachers with insights into the effectiveness and understanding of AI-assisted tutoring systems.

*Data analysis*

Particular attention was paid to students’ perceptions of the clarity and effectiveness of the explanations provided by the AI-based tutors (Fig. 4). Pie charts were employed to visually represent student responses to different aspects of the AI instructor integration, facilitating straightforward data interpretation. The findings are derived from interviews with 30 teachers and a survey of 63 B1-level students at the Kazakh British Technical University (KBTU) in Kazakhstan.

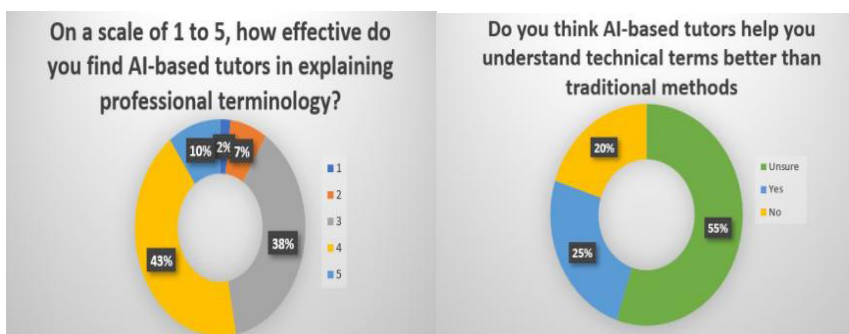


Figure 4- Survey: AI-based tutors in foreign language education

According to the survey, a substantial proportion of students (69%) interacted with AI tutors during the project experiment, whereas a notable minority (31%) did not utilize AI tutors. Possible reasons for non-use include technical challenges, missed sessions, and a preference for traditional teacher-led instruction. This underscores the importance of addressing technical barriers and facilitating the seamless integration of AI tools within conventional educational frameworks.

Overall, perspectives on the effectiveness of AI tutors are predominantly positive. A total of 91% of students (comprising 53% who found AI tutors highly effective and 38% who considered them very helpful) expressed favorable views regarding AI tutor interventions. This suggests that AI-based tutoring systems can serve as valuable resources in the learning process. Nonetheless, a small but significant proportion (9%) perceive their usefulness as limited; understanding the factors influencing this perception is crucial for the ongoing improvement of AI tutor design and functionality.

A noteworthy finding is that 55% of respondents were uncertain about the relative usefulness of AI tutors versus traditional teaching methods for acquiring technical vocabulary. This indicates a need for further research to evaluate the

comparative advantages and limitations of each approach in developing technical language skills. Conversely, 25% of students expressed strong confidence in the ability of AI tutors to enhance technical vocabulary knowledge, aligning with previous research highlighting the benefits of personalized learning approaches (e.g., Sumakul et al., 2022). While 20% oppose their use in educational settings, ongoing research and development efforts present opportunities to address these concerns through enhanced functionality and pedagogical integration.

There is a positive trend in student assessments of AI tutors' abilities to clarify grammatical concepts. A substantial majority (66%) reported finding them extremely helpful, with an additional 24% indicating moderate helpfulness. These findings suggest that AI tutors can serve as effective tools for establishing a solid foundational understanding of foreign language grammar, aligning with research indicating that AI can provide personalized instruction to address individual learner needs (Huang et al., 2021).

In contrast, student responses regarding the usefulness of AI tutors in developing professional communication skills are more nuanced. Nearly 36% of students reported not using AI tutors regularly for this purpose, while another 36% used them infrequently, and 28% did not use them at all. These results indicate that, although AI tutors have potential to enhance communication skills, further research and system refinement are necessary. Future investigations should explore specific functionalities and training exercises that are most effective in this domain. It is also important to consider Kasimi and Fidan's (2023) emphasis on the significance of human interaction in language learning, particularly in discussions and debates. Therefore, AI tutoring may need to be complemented with opportunities for authentic communicative practice to optimize language acquisition.

In summary, the research revealed diverse student perspectives on the role of AI-based tutors in learning professional terminology in English. While many students value the personalized guidance and instructional support provided by AI tutors—particularly for grammar, vocabulary explanations, and subject-specific context comprehension—further research is necessary to investigate how these services impact student communication and collaboration skills. Educators collaborate to foster the development of critical thinking abilities. By understanding these varying viewpoints and making appropriate adjustments to the deployment of AI tutors, we can harness the potential of artificial intelligence to enhance the effectiveness of foreign language learning experiences.

#### *Teachers' insights on AI tutors*

In addition to the results of the student survey, this paper also presents qualitative data derived from interviews with 30 educators at Kazakh British Technical University (KBTU) in Kazakhstan. These interviews explored teachers' experiences with the implementation of artificial intelligence-based tutoring systems in foreign language (FL) classrooms, with particular attention to the perceived advantages and limitations of this technology. The potential of artificial intelligence to enhance student learning outcomes is widely acknowledged within the educational research community. According to Tussupbekova (2019), digital

transformation in higher education requires careful methodological adaptation to preserve communicative interaction while introducing technological innovation. The scholar notes that artificial intelligence tools should function as supportive instruments enhancing learner autonomy rather than replacing teacher-mediated interaction.

*Advantages of AI-assisted tutors:*

- AI-based tutors created on the HeyGen platform seem to function more as guiding instructors. These tutors would simplify the educational process by providing students with AI-powered guidance on how to conduct their out-of-class activities. As a result, the learning process can be improved, and educators can modify their lessons to target the specific weaknesses and learning preferences of individual students.

- AI-assisted instructors may provide video lessons to solve specific grammar problems, professional terminology acquisition, and pronunciation issues.

- AI-based instructors can serve as online tutors, giving students the freedom to develop language skills outside of the classroom. Students gain more power to manage their learning, leading to better learning outcomes.

- Interactive AI tutors can make learning meaningful and fun for students.

- AI tutors are available to students at all times, allowing them to access the curriculum and practice at a time that is most convenient for them. This is especially true for students who have busy schedules or need extra practice outside of class.

*Drawbacks and Considerations:*

- Some teachers worry that students may become overly dependent on AI tutors, ignoring the need to foster peer-to-peer learning.

- Teachers pointed out that AI-based tutors were not good at teaching complex communication skills such as critical thinking, creative problem solving, and participation in group discussions. Personal consultation and guidance from certified teachers in these areas are required. The use of AI tutors should not diminish the role of teachers. Teachers note the ongoing value of teachers as facilitators, curriculum designers, and providers of personal support and advice.

Finally, the results from teachers' interviews suggest that AI tutors can serve as an effective supplementary tool in the foreign language (FL) classroom, particularly when employing strategies to support traditional educators. A blended learning approach that combines the strengths of human teachers and AI technology may optimize student learning outcomes.

## **Results and Discussion**

This study proposes an innovative approach to teaching English to technical students, particularly those pursuing careers at sea. The research integrates traditional classroom instruction with artificial intelligence-assisted learning to enhance students' language and communication skills essential for employment. The research methodology includes the following steps:

- Students first assess their English proficiency through an AI-based evaluation exam, which determines their placement in appropriate classes.
- AI-supported lessons facilitate the acquisition of grammar and vocabulary prior to progressing to specialized subject matter.
- Students engage in projects related to their field, such as marine terminology, with guidance provided by AI tutors.
- An additional AI-driven course focuses on developing students' abilities to organize ideas, write, and communicate effectively in professional contexts.

The integration of traditional classroom instruction with AI-assisted independent study enables students to exercise greater autonomy over their learning process. The proposed framework aims to facilitate not only the acquisition of technical knowledge but also the development of effective communication skills in English within students' respective fields.

Students enrolled in a technical university program showed a preference for utilizing AI tutors, particularly for the development of technical terminology. Approximately 69% actively employed AI tutors for project work, while 31% avoided them, likely due to technical difficulties or a preference for conventional methods. Overall, 91% of students rated their AI instructors positively; more than half found them effective (53%) or helpful (38%). Interestingly, a significant proportion (55%) expressed dissatisfaction with traditional instruction methods for terminology development. Conversely, 25% indicated that AI tutors contributed to their vocabulary improvement, whereas 20% opposed the use of AI in education altogether. Regarding grammatical skills, 66% of students found AI tutors beneficial. However, the impact of AI on communication skills remains less conclusive, warranting further research.

Educators at Kazakh-British Technical University in Kazakhstan believe that AI-assisted tutors can promote self-directed learning by identifying student weaknesses and providing targeted practice, thereby fostering sustained independence. They also highlight AI's role in increasing engagement and offering round-the-clock access. Nevertheless, challenges such as over-reliance on technology and the development of critical thinking skills remain. Overall, faculty members view AI as a valuable supplement to, rather than a replacement for, traditional foreign language instruction.

The discussion proposes several avenues for future research:

1. *AI Integration into curriculum.* Investigating the most effective methods for incorporating AI instructors into foreign language (FL) curricula while ensuring seamless integration with existing teaching methodologies.
2. *AI for developing communication skills.* Developing AI instructors with enhanced capabilities to support the development of advanced communication skills, including collaborative learning and critical thinking.
3. *Long-term impact studies.* Conducting longitudinal studies to assess the

enduring effects of AI tutors on students’ language proficiency, critical thinking skills, and academic achievement. To enhance the perception-based survey results, a comparative assessment of vocabulary was conducted before and after the 12 - week program. The experimental group (n = 30) and the control group (n = 33) finished the same tests on professional terminology.

Both groups improved their accuracy, especially the experimental one from 56% to 79% (+23%), while the control group increased by 9% from 58% to 67%

An assessment using a rubric for oral presentations revealed that 67% of students in the AI-assisted group met B1+ criteria for professional terminology usage, in contrast to 42% of the control group.

Despite the restricted number of participants, the rate of increase comparison shows more pronounced improvement among the experimental participants.

Table 2. Comparative Vocabulary Performance

Group	Pre-test (%)	Post-test (%)	Improvement (%)
Experimental (AI)	56	79	+23
Control (Traditional)	58	67	+9

*Scientific novelty*

The originality of this study comes from testing a reverse teaching method that uses AI-assisted tutors to help students learn professional maritime terminology. It offers comparative quantitative evidence from both experimental and control groups, highlighting notable word knowledge improvements within this focused technical field.

**Conclusion**

This study demonstrates that AI tutors have the potential to serve as valuable tools in the FL classroom, particularly when integrated thoughtfully within a flipped learning framework. By addressing the identified limitations and advancing AI capabilities through ongoing research and development, educators can leverage this technology to create a more dynamic, personalized, and effective learning environment for students acquiring professional English terminology.

Although positive trends are evident in the results, they should be interpreted carefully in their interpretation because of the short duration of the intervention and the small sample size. To verify the long-term effectiveness, more studies with larger groups and detailed statistical analysis are needed to confirm the findings.

**REFERENCES**

[1] Bluescreen. 86 startup projects have been mapped in Kazakhstan//Digital Business [V Kazakstane 86 startap proektov nanesli na kartu//Digital Business]. - 2022. Access mode: <https://digitalbusiness.kz/2022-06-28/v-kazahstane-86-startap-proektov-nanesli-na-kartu/> [Date of access: 26.10.25].

[2] Nguyen N.D. Exploring the role of AI in education //London Journal of Social Sciences. -2023. - (6). – p. 84–95.

[3] Grigule L., Mincane R.S., Odiņa I. Introducing Professional Terminology in Multilingual Education Teacher Programs: Reasoning and Practice // International Journal of Multilingual Education. - 2014. - II(3). - 13–34.

[5] Alharbi W. AI in the Foreign Language Classroom: A Pedagogical Overview of Automated Writing Assistance Tools//Education Research International. - 2023. -1–15. <https://doi.org/10.1155/2023/4253331>

[4] Valeyeva E.E. Methodology to Teach the English-Language Professional Terminology to Non-linguistic Students [Metodika obucheniya studentov neyazikovogo vuza angloyazichnoi professionalnoi terminologii]// Gramota. -2019.-Volume 4, Issue 4.- P.140-144. Access mode: file:///C:/Users/User/Downloads/ped20190175.pdf [Date of access: 26.10.25].

[5] Sumakul D.T.Y.G., Hamied F.A., Sukyadi D. Artificial Intelligence in EFL Classrooms: Friend or Foe? //Learn Journal: Language Education and Acquisition Research Network.-2022.- 15(1).-232–256. Access mode: <https://files.eric.ed.gov/fulltext/EJ1336138.pdf> [Date of access: 26.10.25].

[6] Rusmiyanto R. et.al. The role of Artificial Intelligence (AI) in developing English language learner’s communication skills//Journal on Education. - 2023. -6(1). - pp.750–757.

[7] Schmidt T., Strasser T. Artificial Intelligence in Foreign Language Learning and Teaching: a Call for Intelligent Practice //Anglistik. - 2022. -33(1). - pp.165–184.

[8] Akinwalere S.N., Ivanov V. Artificial Intelligence in Higher Education: Challenges and Opportunities//Border Crossing. London, UK. - -2022. - 12(1). - pp.1–15.

[9] Popenici S.A.D., Kerr Sh. Exploring the Impact of Artificial Intelligence on Teaching and Learning in Higher Education//Research and Practice in Technology Enhanced Learning. - 2017.- 12(22). - pp.1-13.

[10] Kasimi Yu., Fidan Ş. An Investigation into Artificial Intelligence (AI) in the English as a Foreign Language (EFL) Context//International Journal of Educational Spectrum. - 2023. - 5(2). - P.269-280.

[11] Mahmoud R.H. Implementing AI-based Conversational Chatbots in EFL Speaking Classes: An Evolutionary Perspective//Research Square. - 2022. - pp.1-21.

[12] Warner N. Create AI tutor for online education with Heygen. - 2025. Access mode: <https://www.heygen.com/blog/online-educate> [Date of access: 26.10.25].

[13] Dzhsubalieva D.M. Digital technologies in competence-based foreign language education // Bulletin of Ablai Khan KazUIR&WL. – 2021. – №4. – P. 45–52.

[14] Sarsembayeva G.K. Professionally oriented foreign language training in non-linguistic universities // KazUIR&WL Bulletin. – 2020. – №2. – P. 88–95.

[15] Tussupbekova M.K. Digital transformation of foreign language education in Kazakhstan // Bulletin of Ablai Khan KazUIR&WL. – 2019. – №3. – P. 102–110.

## ЖАСАНДЫ ИНТЕЛЛЕКТ-КӨМЕКШІЛЕР КӘСІБИ ТЕХНИКАЛЫҚ ТЕРМИНОЛОГИЯНЫ МЕНҒЕРУДЕ

\*Жубанова Ш.А.<sup>1</sup>, Кожахметова З.Ж.<sup>2</sup>,  
Джусубалиева Д.М.<sup>3</sup>, Смагулова С.С.<sup>4</sup>

\*<sup>1,2</sup>ҚБТУ, Алматы, Қазақстан

<sup>3</sup>Абылай хан ҚазХҚ және ӘТУ, Алматы, Қазақстан

<sup>4</sup>А. Мырзахметов Көкшетау университеті, Көкшетау, Қазақстан

**Аңдатпа.** Зерттеу мақалада техникалық университет контекстінде жасанды интеллект негізіндегі тәлімгерлердің шетел тілі біліктілігін арттыруға әлеуеті қарастырылған, атап айтқанда, студенттердің кәсіби терминологияны меңгеруіне ерекше назар аударылады. Зерттеушілер күрделі техникалық ұғымдарды меңгеруді жеңілдету үшін жасанды интеллект негізіндегі тәлімгерлер мен дәстүрлі сынып сабақтарын біріктіретін «кері оқыту» әдісін қолданды. Бұл ұғымдарды түсіну тиімді коммуникация, түсіну және кәсіби жетістік үшін маңызды болып табылады. Жасанды интеллект тәлімгерлерін адам оқытушыларымен біріктіру екі тәсілдің де артықшылықтарын максимизациялауға мүмкіндік береді. Әдебиет шолуында жасанды интеллект оқытушыларының тілді үйренудегі артықшылықтары мен шектеулері көрсетіледі. Деректердің сапасы және этикалық аспектілер де маңызды рөл атқарады, себебі АІ тәлімгерлері жеке оқыту тәжірибесін ұсынады және студенттердің қызығушылығын сақтауға көмектеседі.

Сонымен қатар, зерттеу interpersonal қарым-қатынастардың коммуникативтік дағдыларды дамытуда маңызды екенін көрсетеді. «Кері оқыту» ортасында кәсіби терминологияны меңгеру процесі бес негізгі компоненттен тұрады: диагноз қою, стратегиялық мақсаттар, мазмұн және ішкі ұйымдастыру, сондай-ақ бағалау. Деректер жинау үшін зерттеушілер сауалнама (60 студент) және оқытушылармен сұхбат (30 профессор) әдістерін қолданды. Бұл зерттеу Қазақстан-Британ техникалық университетінде прогрессивті және тиімді білім беру жүйесін түсінуді, жасанды интеллект тәлімгерлерінің құтулері мен шектеулерін анықтауды, техникалық мамандық студенттері үшін әлемдік деңгейде бәсекеге қабілетті тілдік дағдыларды меңгеруді қамтамасыз ету мақсатында жүргізілді.

**Тірек сөздер:** шетел тілін оқыту, аударылған оқыту әдісі, дәстүрлі оқыту, жасанды интеллект тәлімгерлері, кәсіби терминология, техникалық университет, тілдік құзыреттілік, оқыту әдістемесі

## ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ-ПОМОЩНИКИ В ОСВОЕНИИ ПРОФЕССИОНАЛЬНОЙ ТЕХНИЧЕСКОЙ ТЕРМИНОЛОГИИ

\*Жубанова Ш.А.<sup>1</sup>, Кожахметова З.Ж.<sup>2</sup>,  
Джусубалиева Д.М.<sup>3</sup>, Смагулова С.С.<sup>4</sup>

\*<sup>1,2</sup>ҚБТУ, Алматы, Казакстан

<sup>3</sup>КазУМОиМЯ имени Абылай хана, Алматы, Казакстан

<sup>4</sup>Кокшетауский Университет имени А.Мырзахметова, Кокшетау, Казакстан

**Аннотация.** В статье рассматривается потенциал цифровых тьюторов на основе искусственного интеллекта в целях повышения уровня владения

иностранным языком в условиях технического университета, с особым акцентом на освоение студентами профессиональной терминологии. В работе использована модель «перевернутого обучения», сочетающая тьюторы искусственного интеллекта с традиционными формами обучения для освоения сложных технических концепций. Понимание указанных концепций является фундаментальным условием для обеспечения эффективной коммуникации, глубокого осмысления предмета и достижения профессиональных целей. Сочетание искусственного интеллекта в роли наставников и участие преподавателей позволяет максимально использовать преимущества обоих подходов. Обзор литературы выявляет как преимущества, так и ограничения использования искусственного интеллекта в качестве инструкторов при обучении иностранным языкам. Важными аспектами также являются качество данных и этические вопросы, поскольку AI-тьюторы обеспечивают персонализированный процесс обучения и способствуют поддержанию высокой мотивации студентов.

Дополнительно, исследования подчеркивают значимость межличностных отношений в развитии коммуникативных навыков. Процесс подготовки к изучению профессиональной терминологии с использованием современных технологий в условиях «перевернутого обучения» включает пять ключевых компонентов: диагностику, стратегические цели, содержание и внутреннюю организацию, а также оценивание. Для сбора данных исследователи применили смешанную стратегию, включающую анкетирование (60 студентов) и интервью с преподавателями (30 профессоров). Настоящее исследование направлено на получение информации о прогрессивной и эффективной системе образования в Казахстанско-Британском Техническом Университете, с целью определения ожиданий и ограничений использования искусственного интеллекта в роли наставника, а также обеспечения развития необходимых языковых навыков у студентов технических специальностей для успешной интеграции в глобальную среду.

**Ключевые слова:** обучение иностранным языкам, перевернутое обучение, традиционные методы преподавания, интеллектуальные тьюторы на базе искусственного интеллекта, профессиональная терминология, технический университет, языковая компетентность, методика обучения

*Received/ Мақала түсті / Статья поступила: 26.10.2025.*

*Accepted / Жариялауға қабылданды / Принята к публикации: 26.06.2026.*

***Information about the authors:***

Zhubanova Sholpan Aldabergenovna - assistant professor, Kazakh-British Technical University, e-mail: sh.zhubanova@kbtu.kz

Kozhakhmetova Ziyada Zhanabaikyzy - senior-lecturer, Kazakh-British Technical University, e-mail: z.kozhakhmetova@kbtu.kz

Dzhusubaliyeva Dina Muftakhovna — professor, Ablai Khan Kazakh University of International Relations and World Languages, e-mail: dinaddm@mail.ru

Smagulova Saule Saparovna – senior lecturer, A.Myrzakhmetov Kokshetau University, e-mail: smagulova\_saule\_1954@mail.ru

***Авторлар туралы мәлімет:***

Жубанова Ш.А. – ассистент профессор, Қазақстан-Британ Техникалық Университеті, e-mail: sh.zhubanova@kbtu.kz

Қожахметова З.Ж.- аға оқытушы, Қазақстан-Британ Техникалық Университеті, e-mail: z.kozhakhmetova@kbtu.kz

Джусубалиева Д.М.- профессор, Абылай хан атындағы Қазақ Халықаралық Қатынастар және Әлем Тілдері Университеті, e-mail: dinaddm@mail.ru

Смагулова С.С.- аға оқытушы, А. Мырзахметов атындағы Көкшетау университеті, e-mail: smagulova\_saule\_1954@mail.ru

***Информация об авторах:***

Жубанова Ш.А.- ассистент-профессор, Казахстанско-Британский Технический Университет, e-mail: sh.zhubanova@kbtu.kz

Қожахметова З.Ж.- сениор-лектор, Казахстанско-Британский Технический Университет, e-mail: z.kozhakhmetova@kbtu.kz

Джусубалиева Д.М.- профессор, Казахский Университет Международных Отношений и Мировых Языков им.Абылай хана, e-mail: dinaddm@kbtu.kz

Смагулова С.С.- старший преподаватель, Кокшетауский университет им.А.Мырзахметова, e-mail: smagulova\_saule\_1954@mail.ru