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**Integrating AI-generated Technical Discourse into English for Specific
Purposes for IT and Engineering Students**

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***Abstract.** The relevance of the study is determined by the rapid advancement of artificial intelligence and its increasing integration into educational contexts, which requires a reconsideration of approaches to developing professional communicative competence in higher education. In modern technology-driven environments, students are expected not only to possess adequate English proficiency but also to critically interpret, evaluate, and produce discipline-specific technical discourse. The purpose of the study is to examine the effectiveness of integrating AI-generated texts into ESP instruction for the development of students'*



*professional communication skills, with a particular focus on rhetorical competence. The study analyzes the characteristics of AI-generated technical discourse and identifies the pedagogical potential of artificial intelligence tools in language education. The empirical part of the research was conducted at the National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute.” AI-generated texts were used as instructional materials for analysis, critique, discussion, and revision. **The research methods** are based on the theoretical analysis of scientific literature, comparative analysis, a pedagogical experiment, and systematic observation of the learning process. **The conclusions** indicate that students demonstrated increased rhetorical awareness, improved ability to structure technical arguments, and enhanced skills in adapting communication to different professional audiences. A significant outcome of the study was the development of professional ethos, logical reasoning (logos), and communicative flexibility. Additionally, improvements were observed in oral communication skills, particularly in the preparation and delivery of technical presentations based on AI-generated materials. The findings also revealed increased student motivation and engagement in the learning process. The results confirm that the integration of AI-generated technical discourse into ESP instruction is an effective pedagogical approach that contributes to the development of professional communicative competence among future engineers and IT specialists.*

Keywords: *Artificial intelligence (AI), technical discourse, engineers, information technology, professional communication*



Інтеграція ШІ-генерованого технічного дискурсу в навчання англійської мови для професійних цілей студентів ІТ та інженерного фаху

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Анотація:** Актуальність дослідження зумовлена стрімким розвитком штучного інтелекту та його активним впровадженням у сферу освіти, що вимагає переосмислення підходів до формування професійного мовлення майбутніх фахівців. У сучасному технічно орієнтованому середовищі студенти повинні не лише володіти англійською мовою, але й уміти критично інтерпретувати, створювати та оцінювати професійно релевантний технічний дискурс. **Метою** дослідження є аналіз ефективності використання AI-генерованих текстів у процесі викладання ESP для розвитку професійних комунікативних навичок студентів, з особливим акцентом на риторичну компетентність. У ході дослідження розглянуто особливості AI-генерованого технічного дискурсу, а також визначено педагогічний потенціал використання інструментів штучного інтелекту в освітньому процесі. Експериментальна частина дослідження була проведена у Національному технічному університеті України «КПІ імені Ігоря Сікорського». **Методи



*дослідження ґрунтуються на теоретичному аналізі наукової літератури, порівняльному аналізі, педагогічному експерименті та систематичному спостереженні за навчальним процесом. У процесі навчання AI-генеровані тексти використовувалися як дидактичний матеріал для аналізу, редагування, критичного обговорення та переосмислення. **Результати показали, що студенти демонструють підвищення риторичної обізнаності, покращення здатності структурувати технічні аргументи, а також розвиток навичок адаптації мовлення до різних аудиторій. Важливим результатом стало формування у студентів професійної етичної відповідальності (ethos), логічного мислення (logos) та комунікативної гнучкості. Крім того, спостерігалося покращення якості усного мовлення, зокрема під час підготовки презентацій і технічних виступів на основі AI-матеріалів. Дослідження також засвідчило підвищення мотивації студентів та їх залученості до навчального процесу. Отримані результати підтверджують, що інтеграція AI-генерованого технічного дискурсу в ESP навчання є ефективним педагогічним інструментом, який сприяє розвитку професійної комунікативної компетентності майбутніх інженерів та IT-фахівців.***

Ключові слова: *штучний інтелект (ШІ), технічний дискурс, інженери, інформаційні технології, професійна комунікація.*

The problem statement. Artificial intelligence (AI) is rapidly penetrating all spheres of human activity and life. Education is not an exception. With the fast development of technology, artificial intelligence (AI) has continued to be applied to education. This growing integration of artificial intelligence in education has naturally led to a reconsideration of how professional communication is developed within specific academic and professional domains, especially in engineering and information technology. The development of artificial intelligence (AI) has significantly influenced and transformed professional communication in engineering



and information technology (IT) fields. Future engineers and IT specialists are expected not only to understand professional English but also to critically interpret, evaluate, and produce technically accurate and context-appropriate discourse. Beyond written communication, effective oral communication is equally essential, as engineers must convey complex technical knowledge to diverse stakeholders. Traditional university classes provide limited opportunities for developing these skills, as sustained, individualized training and comprehensive feedback on verbal and non-verbal aspects of public speaking are time-intensive and difficult to implement. Here, AI serves as a bridge, enabling personalized practice, automated assessment, and continuous improvement in both written and oral professional communication enhancing learning experience [14].

English for Specific Purposes (ESP) instruction plays a pivotal role in preparing engineering and IT students for professional communication in globalized technical environments. Traditional ESP materials, however, often rely on static textbooks or limited collections of authentic texts, which may not fully reflect the dynamic nature of contemporary technical discourse. In this context, AI-generated technical discourse emerges as a valuable yet underexplored resource, offering new pedagogical opportunities by providing adaptable, up-to-date, and discipline-specific language input tailored to learners' professional needs. The integration of classical models of second language acquisition with the capabilities of artificial intelligence (AI) offers both a robust theoretical foundation and practical insights for educators and learners in experiencing technical discourse.

From an educational perspective, integrating AI into ESP classrooms reflects the shift toward student-centered, competence-based learning in higher education. AI tools address both functional and motivational aspects of learning. Engineering and IT students need more than just language accuracy—they need to communicate effectively, think critically, and navigate professional discourse in digital environments. AI-generated materials offer input and feedback that adapt to each



learner, taking into account their unique learning style, the pace that suits them best, and the situations in which they learn most effectively. AI-generated texts provide diverse, real-world material that students can analyze, compare, and use to strengthen their own communication skills. At the same time, this integration invites students to consider issues of authorship, responsibility, and ethical communication in AI-influenced professional environments.

Despite growing interest in AI-assisted language learning, research on the use of AI-generated technical discourse in ESP is still limited. The present study explores the integration of AI-generated technical discourse into ESP instruction as a means of developing professional communication skills of engineering and IT students, with particular attention to rhetorical competence, preparing them for real-world professional interaction in technologically advanced environments.

Analysis of recent research and publications. The origins of artificial intelligence are usually traced to the 1950s, when researchers in the United States began developing machines capable of performing complex tasks, such as playing chess or making simple decisions [2]. Subsequently, artificial intelligence has been integrated into different fields of human activity, including education, and more specifically into teaching of English for Specific Purposes (ESP) instruction. Numerous studies by both international and domestic researchers have been dedicated to this issue.

Recent international studies indicate that artificial intelligence (AI) technologies are increasingly being explored as tools to enhance English for Specific Purposes (ESP) instruction by supporting personalized learning, improving engagement, and strengthening professional communication outcomes. For example, He, Zhang, and Huang argue that AI integration can address diverse student needs and improve both language abilities and learners' capacity to use English in professional contexts, suggesting a strategic framework for AI-enhanced ESP education that aligns with future job demands [6]. They think that the introduction of



artificial intelligence (AI) will provide teachers with new solutions. Similarly, research focusing on specific AI tools such as ChatGPT has demonstrated positive effects on language proficiency and ESP skill development. In particular, Mahapatra reports that the use of ChatGPT as a formative support tool significantly enhanced university students' writing performance [12]. The study shows that generative AI can accelerate improvement in professional and academic writing, which is especially relevant for ESP courses aimed at developing discipline-specific communication skills in higher education. Furthermore, Patty argues that artificial intelligence can enhance language learning through personalized guidance, interactive engagement, and continuous progress tracking. At the same time, the author emphasizes the importance of ethical and responsible AI integration in education, particularly in maintaining transparency, inclusiveness, and the role of teachers in the learning process [13]. Researcher Kizi highlights that AI-based exercises improve student motivation, oral confidence, and pragmatic awareness — all integral to professional communication in technical fields [9]. He argues that AI driven tools offer scalability, personalization, and real-time feedback, which traditional classroom methods cannot always provide. The researcher has given as the example, chatbots, that can simulate authentic workplace dialogues in which learners practice formal email exchanges, negotiation strategies, or culturally appropriate turn-taking. AI-based speech recognition systems can analyze intonation, register, and fluency, providing learners with individualized feedback on the pragmatic use of language.

British researchers have also investigated AI's role in English language teaching. In a landmark report, Edmett, Ichaporia, Crompton, and Crichton systematically reviewed how AI tools were used to support the development of English skills, including writing, highlighting both opportunities for personalized learning and the need for further research into sustained pedagogical impacts within ESP frameworks [4]. Within this evolving research landscape, scholars have



increasingly focused on particular AI-driven tools, such as ChatGPT, to better understand their practical value for learners' engagement with professional English. Researchers suggest that tools such as ChatGPT enable learners to engage with language reflecting real-world professional contexts, offering models of technical discourse that enhance vocabulary development and the organization of information [4]. Baltaci, Herrmann, and Turkmen (2024) view AI integration in engineering education as a shift toward adaptive, student-centered learning that supports both technical understanding and clear professional communication [1]. From an ESP perspective, such practices foster the professional discourse competence required of future engineers and IT specialists in English-medium contexts.

Ukrainian scholars have contributed to the discussion on the implementation of artificial intelligence (AI) in tertiary education and foreign language instruction. They have explored AI tools' potential to transform language teaching and enhance digital competence among learners and educators. For instance, Liashenko, Chepeliuk, and Rumiantseva (2025) examined AI integration in ESP for STEM students, finding that personalized learning pathways and virtual tutors can support communication skills development and motivation [11]. Dziubata (2024) offers practical insights into the application of AI technologies like ChatGPT in English (ESL and ESP) instruction at agro-technical universities, noting the benefits of content localization and personalized materials for profession-specific communication skills [3]. Khoroshailo and Kochergina demonstrate how AI can improve the quality of foreign language teaching, supporting personalized learning and professional discourse competence development in higher education [8]. Adding to this discussion, scientists Kovalenko and Baranivska highlight the importance of balancing technological integration with essential human elements of teaching, suggesting ways to incorporate AI tools without diminishing the role of traditional, interactive pedagogies, thus ensuring that professional communication skills are developed effectively in ESP contexts [10].



Thus, the discussion confirms that integrating AI-generated technical discourse into ESP instruction corresponds to global trends in engineering education while remaining sensitive to local educational contexts. The convergence of international and Ukrainian research underscores the importance of a balanced approach in which AI serves as a supportive tool that enriches professional language education without diminishing the role of human judgment and pedagogical guidance.

Formulation of the objectives of the article (task setting). This study aimed to explore the effectiveness of integrating AI-generated technical discourse into English for Specific Purposes (ESP) instruction for developing the professional communication skills of engineering and IT students. The tasks of the study are to: examine the characteristics of AI-generated technical discourse used in engineering and IT fields, and determine the pedagogical potential of AI-assisted tools in ESP instruction.

Identification of Previously Unaddressed Aspects of the General Problem. This study identifies previously underexplored aspects of integrating AI-generated technical discourse into ESP instruction, particularly in relation to the development of rhetorical competence in engineering and IT education. It also highlights the limited attention given to the pedagogical use of AI tools for fostering students' ability to critically adapt and transform technical language for diverse professional communication contexts.

Presentation of the main research material. AI-generated technical discourse refers to professionally oriented texts produced or supported by artificial intelligence systems. In higher education, such discourse is increasingly used in English for Specific Purposes (ESP) to develop students' professional communicative competence rather than isolated language knowledge. For engineering and IT students, this competence includes the ability to clearly express



themselves explaining technical ideas, justifying decisions, and participate persuasively in professional communication, which makes rhetoric a key focus of ESP instruction.

In our ESP classes at the National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute” (KPI), the integration of AI-generated technical discourse was implemented not as a replacement for teaching, but as a deliberately structured pedagogical practice aimed at developing students’ professional communicative skills. Large language models (including GPT-based tools) were used to generate sample technical texts and methodologically enhanced examples and samples, which then served as didactic material for analysis, critique, discussion, and revision. The results reported below are based on systematic classroom observations, analysis of students’ written and oral performance, and guided reflective discussions conducted throughout the course.

First, students demonstrated a noticeable increase in rhetorical awareness when working with AI-generated technical texts. They were encouraged to analyze communicative purpose and target audience. As a result, they became more attentive to how technical information is introduced and explained, rather than focusing solely on grammatical and lexical correctness. Many students were able to identify typical weaknesses in AI-generated discourse, such as excessive generalization, insufficient support for technical claims, or a lack of clarity for a specific professional audience.

Second, consistent improvement was observed in students’ ability to structure technical arguments. In a series of instructor-designed tasks, AI-generated drafts were used as baseline texts that students revised by strengthening logical coherence, clarifying cause–effect relationships, and explicitly supporting key statements with technical reasoning or examples. Over time, students’ revised texts demonstrated clearer introductions, more logically sequenced paragraphs, and more persuasive conclusions. These changes indicate the development of rhetorical *logos*, which is essential for professional communication in engineering and IT contexts.



Third, AI-assisted activities contributed significantly to the development of audience awareness. Students were regularly asked to adapt AI-generated technical explanations for different target audiences, including IT engineers, project managers, and non-technical users. Such tasks resulted in more appropriate terminology choice, improved register control, and a better balance between precision and accessibility. Students learned to explain complex technical concepts persuasively while maintaining professional accuracy.

Another important outcome was the formation of professional ethos. Through critical engagement with AI-generated discourse, students developed a stronger sense of responsibility for the content they produced. Classroom discussions and reflection tasks revealed that students increasingly perceived themselves as authors and professional communicators rather than passive users of AI tools. Greater attention was paid to accuracy, credibility, and ethical communication, particularly when evaluating or revising AI-generated technical information.

In addition to written communication, positive effects were observed in students' oral rhetorical performance. AI-generated texts were frequently used as preparatory material for presentations, technical briefings, and short professional talks. After rhetorical revision and audience adaptation, students delivered more structured and purpose-oriented oral presentations, characterized by clearer problem statements, logically developed main points, and concise conclusions. This transfer from written to spoken discourse demonstrates the effectiveness of AI-supported rhetorical training in ESP instruction.

Finally, student engagement and reflective learning increased noticeably. Students reported that working with AI-generated technical discourse made abstract rhetorical principles more tangible and easier to apply in practice. Reflection tasks showed greater confidence in discussing communication strategies and a deeper understanding of the role of rhetoric in professional engineering and IT communication. Overall, the findings suggest that when AI-generated texts are



pedagogically mediated by the teacher, they can become a powerful tool for developing professional communicative competence rather than a shortcut that undermines learning.

Conclusions. So, the integration of AI-generated technical discourse into ESP instruction at KPI has demonstrated its potential to enhance the professional communicative competence of engineering and IT students. By combining AI-generated texts with exercises focused on ethos, logos, and pathos, students are equipped with the skills necessary to participate effectively in a professional environment, enhancing their clarity, logical reasoning, audience awareness, and ethical responsibility. This approach positions Artificial Intelligence (AI) as a practical pedagogical tool, not a replacement for human authorship, fostering critical thinking, reflective learning, and confidence in both written and oral technical communication. A central insight from this study is that ESP in higher education should prioritize communicative competence alongside linguistic accuracy.

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