THE USE OF AI TOOLS IN ESP WITH A FOCUS ON ENGINEERING COURSES

Diana MARCU*

https://doi.org/10.52744/AUCSFLSA.2026.01.21

Abstract:

Due to great advancements in technology, the 21st century has been turned into an era of digital revolution where the Artificial Intelligence emerged in more and more fields of activity, including education and the teaching and studying of foreign languages. The present paper adopts an exploratory approach based on the analysis of current AI tools which may be used in the ESP instruction by teachers and students to mark a transformative shift towards a successful and meaningful process of language acquisition. It relies on both personal teaching experience and the perspective of students majoring in Electrical Engineering at the University of Craiova, Romania when it comes to the use of AI platforms to improve their knowledge of the language. The AI-driven tools which provide context-specific language instruction offer instant feedback, domain-specific interactions, the prospect of autonomous practice, premises for an efficient teaching and learning process. Yet, a successful integration of AI depends on pedagogical, ethical and practical factors.

KEYWORDS: Artificial Intelligence; AI-platforms; context-specific language; English for Specific Purposes; enhanced learning

Rezumat:

Datorită marilor progrese din tehnologie, secolul al XXI -lea s-a transformat într-o eră a revoluției digitale în care Inteligența Artificială și-a făcut apariția în din ce în ce mai multe domenii de activitate, inclusiv în educație și predarea și studierea limbilor străine. Lucrarea de față adoptă o abordare exploratorie bazată pe analiza instrumentelor IA prezente care pot fi folosite în sfera ESP de către profesori și studenți pentru a marca o trecere transformatoare spre un proces de succes de învățare a limbii. Lucrarea se bazează atât pe experiența personală de predare cât și pe perspectiva studenților care studiază Ingineria Electrică la Universitatea din Craiova, România, referindu-se la modalitățile prin care aceștia folosesc platformele IA pentru a-și îmbunătăți cunoștințele de limbă. Instrumentele de IA care oferă limbaj adaptat contextului oferă un feedback instant, interacțiuni specifice domeniului, posibilitatea practicii autonome, premise pentru un proces eficient de predare și

* University of Craiova, Faculty of Letters, Department of Modern Languages

învățare. Totuși, o integrare de succes a IA depinde de factori pedagogici, etici și practici.

CUVINTE CHEIE: Inteligența artificială; platforme IA; limbaj adaptat contextului; Engleza pentru Scopuri Specifice; învățare îmbunătățită

1. Introduction

The advancements in technology, the IoT (the Internet of Things) together with the appearance of smart devices have turned the 21st century into an era known for its digital revolution. The Artificial Intelligence, though first proposed by Turing in 1950, found its evolutionary peak starting with 2020, emerging in more and more domains, including education. English as a Foreign/ Second Language is a subject of interest nowadays due to the role of the English language as 'lingua franca' which makes more and more non-native speakers delve into its discovery and learning. Besides the already-included technology into the process of both teaching and learning the language, AI occurs, step by step, into this course of action. AI technology, with its dedicated platforms, has the potential to transform the acquisition of language, so as to make it a motivating and interactive 'journey'. Not only is it valid for ESL but also for English for Specific Purposes, taking into consideration the dominant need of learners to achieve success in a particular area of interest.

English for Specific Purposes (ESP), a branch of English language education, has been continuously evolving ever since the 1960s due to globalization and the development of professional communication around the world. Its main feature is the focus on learners' needs, with an emphasis on specialized linguistic competencies in fields such as business, engineering or medicine. The need for communication openness in various professional contexts has helped to the evolution of ESP in higher education and workplace training. As Dudley-Evans and St John state, "The original flowering of the ESP movement resulted from general developments in the world economy in the 1950s and 1960s: the growth of science and technology, the increased use of English as the international language of science, technology and business, the increased economic power of certain oil-rich countries and the increased number of international students studying in the UK, USA and Australia" (Dudley-Evans, St John, 1998: 19). Focusing on the approach of ESP,

Hutchinson and Waters view it as "an approach not as a product. ESP is not a particular kind of language or methodology, nor does it consist of a particular type of teaching material. Understood properly, it is an approach to language learning, which is based on learner need." (Hutchinson, Waters, 1987: 19). Later on, Laurence Anthony defines ESP as "an approach to language teaching that targets the current and/or future academic or occupational needs of learners, focuses on the necessary language, genres and skills to address these needs, and assists learners in meeting these needs through the use of general and/or discipline-specific teaching materials and methods" (Anthony, 2018: Introduction). In the field of engineering, English serves as the primary medium of communication in research, documentation and international communication. As a result, English for Engineering Purposes (EEP) focusses on students' acquisition of linguistic competencies required in the technical professional contexts.

The progress of NLP (natural language processing), which helps systems understand and generate human language, together with more advanced algorithms represent the benchmark of AI's inclusion in the teaching and learning process. The integration of AI in ESP classes enhances learners' autonomy, with a focus on specific language acquisition for different professional fields: medicine, nursing, engineering or business are some of the examples. It offers adaptive, data-driven solutions for teaching and learning, engaging learners in the process of language acquisition. AI, with its potential for automation and personalization, meets the needs of ESP, an approach which is learner-centred and is based on authentic materials and situations. In the case of the engineering field, AI systems can provide real-world engineering communication scenarios, offer automated feedback on technical writing, overall enhancing the instructional process. Though AI-driven tools offer adaptive feedback and interactive learning environments, the integration of AI within ESP contexts needs long-term investigation.

The present paper adopts an exploratory approach based on the analysis of current AI tools which may be used in ESP instruction in an era where teachers face challenges in making their lectures both appropriate and interactive. It relies on the personal teaching experience with students majoring in the electrical engineering field, specialized in electro

mechanics, power engineering or aviation technology. At the same time, it includes the perspective of students when it comes to the use of AI platforms to improve their knowledge of the language. A successful integration of AI depends though on pedagogical, ethical and practical factors.

2. The integration of AI in ESP tasks

Any ESP course focuses on meeting the needs of the learners. In the academic environment, the specialization undergraduates take represents the starting point in designing a course which serves the future professional requirements of students. Teachers take into consideration the tailored vocabulary students need to acquire, the skills they are to improve so as to become proficient users of the foreign language in various specialized contexts. Thus, teachers face the challenge to find and adapt materials based on authenticity and real-life contexts, to choose tasks which not only are of help in improving skills but are also entertaining to students. As Bălănescu points out, "teaching approaches have shifted their focus from competence to performance, that is, from 'knowing' the language to 'doing' something with the language" (Bălănescu, 2021:100). The digital resources have been and still are of great support, leading students towards a better understanding of the concepts taught, being dynamic and interactive at the same time. For instance, after watching a video on the YouTube platform about electrical circuits, engineering students retain information easier, visualize concepts and gather the proper meaning of the used terminology in a natural and straightforward manner. Nowadays, with the emergence of AI platforms, the chances of creating more dynamic and personalized tasks have increased drastically.

Artificial Intelligence technologies, including adaptive learning systems, natural language processing tools or speech recognition systems enable personalized learning, real-time feedback and automated assessment. They increase the self-esteem of students by offering them the possibility to practise knowledge in an interactive way, to self-direct the learning needs and adjust tasks or proficiency levels at their own pace. Taking into consideration that AI tools provide context-specific language instruction, teachers face the option to use such tools, to implement them into their courses for the improvement of efficiency and outcomes. AI tools

can be used as a valuable support in the acquisition of the language since they cover multiple aspects of language learning, such as specialized vocabulary acquisition, grammar correction or pronunciation training.

These tools should be strategically integrated into the design of the course to complement the traditional instruction. They could be used as a pre-stage activity to pre-teach specific vocabulary and stimulate learners' interest in the subject. This warm-up activity has the potential to set the scene for what it is about to be acquired, increasing students' interest in the subject taught and creating confidence in their knowledge. At the same time, teachers may choose to consolidate knowledge using AI-powered computer programs or platforms so as to assess the comprehension of vocabulary or for follow-up projects. Chosen correctly, with attentive prior investigation on behalf of the teacher, such AI-driven platforms become a valuable aid in the instructional process. George (2023) and Baskara (2023) discuss how ChatGPT is a tool powerful in generating authentic language materials, reading passages or creating realistic dialogues, improving students' reading comprehension skills and language proficiency.

For example, in the case of first year electrical engineering students, on a topic referring to electric wires, teachers may choose a YouTube quiz, created with the help of AI, to ask students guess the right choice of words, making the difference in concepts between wire, cable and cord. It is a fun and engaging activity which prepares learners for what they are about to study in the next stages of the course. To enhance educational content, AI-quizzes can be used as post-stage activities to consolidate learning and assess understanding. Chatbot platforms, based on generative AI, such as ChatGPT or Google's Gemini are at hand for the teacher to design comprehension quizzes based on the taught terminology. In the case of Gemini, teachers direct the process by specifying the topic, for instance 'electrical circuits', target the level of proficiency, provide keywords, such as *capacitor, resistor, current, circuit breaker, etc.,* and choose the question type, as, for example, a matching quiz. Teachers may go further, towards a more advanced method, by asking Gemini create an interactive quiz, only by prompting the request and asking it to use a score at the end based on an uploaded PDF of class notes. It's also a simple method, which does not require advanced computer knowledge on behalf of the teacher, only clear

prompting and the right choice of words stemming from the taught terminology. Such quizzes are of great impact on students, they are motivating and help consolidate acquired vocabulary. Teachers nowadays deal with a generation already adapted and adjusted to advanced technology and smart devices thus, the use of such platforms to create interactive tasks becomes more appealing to them than the scenario where, working with the same terminology, teachers bring in front of students traditional 'multiple-choice' tasks. One drawback of integrating such AI-powered tasks in classes is the high-cost such technology brings on with implementation, maintenance and update. At the same time, technical failures can be upsetting or can even lead to a disrupt in the learning process if the instruction is totally based on technology. On the other hand, if implemented in different stages of the course, such AI-powered tasks are perceived as a break, a fun and interactive activity, highly appealing to students.

3. Students' use of AI tools for English acquisition

Besides providing context-specific language instruction, AI-driven tools, including chatbots, automated writing evaluators or speech recognition systems, tend to become a strong ally in students' attempt to successfully acquire English knowledge. Today, AI-tools for learning English are at hand for students who, depending on preferences or intent, choose among applications such as Grammarly, ELSA Speak, ChatGPT, Google Translate or the gamified Duolingo. Each of these applications brings on a series of advantages for them, students being interested in improving their knowledge of the foreign language. As a result of informal talks with the students in Electrical Engineering from the University of Craiova, Romania, the majority of them said that they are used to accessing AI platforms to ask about unknown information necessary in their daily lives, the most frequently accessed platform being ChatGPT. When studying, depending on the subject, they choose different platforms which they consider of being of real help and complement the learning and understanding process, such as Gemini for Mathematics or Physics.

In the case of acquiring foreign languages, their answers varied. There is the tendency for students to choose a certain AI-application depending on their needs. More precisely, most of them accessed and used the

gamified AI-platform Duolingo in an attempt to learn new languages, those that are not taught in the Romanian schools, such as Spanish, Italian or Japanese. Their choice of a language is based mostly on perceiving such languages as a hobby, an attempt to try acquire 'other' languages, besides those studied in the educational system, having nothing to do with their need of acquiring domain-specific terminology.

As for English, the situation is different. Up to the academic studies, most Romanian students had been studying English for a period averaging eight to ten years. English is taught as a primary foreign language, followed by French or German in the public system of education. Thus, when embarking on their specialized field, learners already possess knowledge of the language at different levels. As a result, the AI- applications are not so frequently used, according to what students state, but more for specific tasks. The most accessed applications are Google Translate and ChatGPT. The moment students encounter unknown terminology, they search it on Google Translate since it is comfortable, easy and 'at-a-click' distance. The downside is that the translation of a specific term may be inaccurate since the application first offers the main meaning of the word and not the domain-specific equivalent. Yet, Google's AI Overview 'enters the stage' with a more precise translation, offering context-based examples, which is of real help to students. For instance, in the aviation field, 'yaw' is translated by Google Translate as 'gură' (i.e. 'mouth'), a totally inappropriate term, while AI Overview describes it specifically, also offering context -related examples, such as 'The plane began to yaw'.

ChatGPT is mainly used by students for assignments or projects. It represents a substantial assistant since it offers valuable tips and instant feedback. When required to formally reply to an e-mail about the delivery of a product, asking for further technical specifications, most students turned to ChatGPT for help, primarily for introductory and ending lines. Some stated that they prompted the application to give feedback on their writing so that they felt more confident before sending it to the teacher. A minority, though, recognized their dishonesty, by prompting the application to write the reply for them. It is a matter of academic dishonesty on behalf of students when they are given home assignments which can be counteracted by teachers only by appealing to students' common sense. Yet, such rare cases should not impede the revolutionary

help an AI-platform brings to the education field. Following a small-scale research, conducted at a state university in Ukraine, on students' perception of ChatGPT-based foreign language learning, Chaikovska et all state that, "activities based on ChatGPT can transform the interaction of engineering students with AI language models from passive to active. Active learning through ChatGPT-based ESP in educational settings can promote meaningful learning experiences and communication practice" (Chaikovska et all, 2024:1115).

Though rarely used, applications such as Grammarly or ELSA Speak were mentioned by students as well. A minority of students used Grammarly at least once to check the accuracy of their statements, while others tried ELSA Speak on rare occasions to confirm their pronunciation and intonation. Students do not seem interested, at least up to now, to try tools that simulate real-life communication since they consider that speaking to a machine is totally different from interacting with human beings.

4. Drawbacks and limitations

The integration of AI-powered tools in education, including English for Specific Purposes, would place a financial burden on academic institutions because of the high costs involved. Though desirable, not all universities are, at least at this moment, ready to integrate such smart technologies in their classes. At the same time, integrating AI in the process of teaching and learning a foreign language involves its integration in the ESP curricula, by aligning AI-tools with learning objectives. Teachers, on the other hand, need training in the field in order to successfully integrate AI into the ESP instruction, to correctly select and evaluate an AI-tool and guide students towards the ethical use of such applications. As Asrifan emphasizes, "the efficacy of technology -enhanced learning relies not solely on software sophistication but also on social, infrastructural, and cultural preparedness" (Asrifan, et all, 2025:179).

Besides its benefits, AI comes with a series of drawbacks for the students. First, there is the tendency to over-rely on smart technologies in order to solve tasks rapidly or complete assignments, without examining information properly or draw logic conclusions. That way, students hinder their critical thinking and take for granted the data AI applications

transmit. At the same time, in the case of ESP, the translation of specific terminology is not always accurate leading to confusion and misunderstanding. In a study investigating how AI tools influence ESP across three faculties at Universitas Adiwangsa Jambi, Indonesia, Resi concluded that, "while AI tools are widely adopted by students, their usage tends to be tool-first, reacted and unscaffolded. Students experienced common difficulties such as literal translation of technical terms, inappropriate register, and incoherent discourse flow issues that varied across disciplines" (Resi, 2025:13). Concerns over academic dishonesty and plagiarism are not to be neglected either since such challenges need careful consideration and proper policies that promote a responsible use of AI in education. Finally, one thing that cannot be substituted by AI is the teacher-student interaction, that bond which includes empathy and understanding of needs which can never be recreated in an artificial environment. AI-tools are a valuable aid in the educational process but, no matter how evolved, they cannot replace the role of educators. According to Vera, "the human touch and expertise of teachers in understanding students' unique needs, emotions and learning styles cannot be replicated by AI. AI tools should be seen as complementary resources that enhance teachers' instructional practices and enable them to better cater to the individual needs of their students" (Vera, 2023:71).

Conclusions

The integration of AI tools in ESP courses paints a complex scenario of benefits and drawbacks. AI technologies enable personalized learning, real-time feedback and automated assessment. By providing domain-specific instruction, AI-tools tailor the needs of any ESP course. They increase the self-esteem of students by offering them the possibility to practise knowledge in an interactive way, to self-direct the learning needs and adjust tasks or proficiency levels at their own pace. AI tools can be used as a valuable support in the acquisition of the language since they cover multiple aspects of language learning, such as specialized vocabulary acquisition, grammar correction or pronunciation training. Thus, AI-tools tend to become a strong ally in students' attempt to successfully acquire English knowledge. However, there are significant concerns over inequities due to infrastructure limitations and teachers' preparedness, issues of

accurate content, the hindering of creativity and critical thinking, as well as apprehensions over academic dishonesty. Last but not least, the human factor, teachers, cannot be replaced by AI but, together, they can form a team which enables an interactive and successful process of language acquisition.

Bibliography

Anthony, L. (2018). *Introducing English for Specific Purposes.* Routledge.

Asrifan, A., et all., (2025). AI-supported Video Projects in ESP Classrooms: A Pedagogical Innovation for Business Communication. In *JELTIS: Journal of English Language Teaching, Linguistics and Literature Studies,* vol. 5, no. 2, pp. 176-200

Baskara, R., Mukarto, M. (2023). Exploring the Implications of ChatGPT for Language Learning in Higher Education. In *Indonesian Journal of English Language Teaching and Applied Linguistics,* vol. 7, no. 2, pp. 343-358

Bălănescu, E.O., (2021). Students' Integration in Target Communities of Practice: an ESP Perspective. In *Revista de Stiinte Politice. Revue des Sciences Politiques,* no. 72, pp. 91-101

Chaikovska, O., et all. (2024). Perceptions of Masters in Electrical Engineering of Using ChatGPT in ESP Learning. In *Engineering for Rural Development,* DOI: 10.22616/ERDev.2024.23.TF230, pp. 1114-1119

Dudley-Evans, T., St John, M., J. (1998). *Developments in ESP. A multi-disciplinary approach.* Cambridge University Press

George, A.S., George, A.H. (2023). A Review of ChatGPT AI's Impact on Several Business Sectors. In *Partners Universal International Innovation Journal,* vol. 1, no. 1, pp. 9-23

Hutchinson, T., Waters, A. (1987). *English for Specific Purposes. A Learning- centred approach.* Cambridge University Press

Resi, S., (2025). Smart English for Smart Professions: Integrating AI-Powered Tools in ERSP Classrooms. In *Proceeding of Tridinanti English Education Studies,* vol. 1, no. 1, pp. 1-14

Vera, F., (2023). Integrating Artificial Intelligence (AI) in the EFL Classroom: Benefits and Challenges. In *Revista Electronica Transformar,* vol. 4, no, 02, pp. 66-77