

AI-DRIVEN PEDAGOGICAL APPROACHES TO FOREIGN LANGUAGE TEACHING AND LEARNING

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Abstract

Following the dynamic changes in contemporary society, learning methods and techniques must adapt and respond to new challenges in the educational context. This article analyses several artificial intelligence-based technologies that we have applied in the process of teaching and learning foreign languages: ChatGPT, Duolingo, and ELIZA. Based on concrete examples of generating requirements in the context of developing written expression skills related to the use of ChatGPT in foreign language teaching, the article highlights educational scenarios in which artificial intelligence chatbots embedded in various digital resources serve both as facilitators of creative expression and as support for autonomous teaching and learning. Regarding other open educational resources, such as Duolingo and ELIZA, it considers their integration into the process of learning a foreign language, connecting them to clear contexts in everyday life. Another aspect of the study focuses on the limits of using artificial intelligence as a tool for language learning, highlighting the human intervention required in this algorithm to solve various linguistic learning challenges.

Keywords: AI-based technologies; educational chatbots; ChatGPT; Duolingo; ELIZA; learning experience;

Introduction

Due to its capacity to leverage vast amounts of data, its generative ability to co-create original content and its ability to mimic human interactions, GenAI is transforming society's educational, social and cultural environment, transcending beyond the data it collects to extend or extrapolate ideas and produce more creative content, including text, images, videos, simulations and more (Henriksen, Mishra & Stern, 2024). The potential of artificial intelligence tools, such as natural language processing, predictive analytics and pattern recognition, is significant for fostering creative and sustainable learning environments. Generative artificial intelligence (GenAI) systems, from simple automatic content generators to sophisticated machine learning models that produce highly interactive and adaptive learning materials, offer a wide range of applications in educational environments. Although the specifics of these tools may evolve, the basic principles of their integration into pedagogical practices remain unchanged and it is essential to adapt to individual differences in teaching and learning processes, emphasizing the importance of pedagogical strategies to address the diverse needs of learners (Henriksen, Mishra & Stern, 2024; UNESCO, 2023; Alvarez-Icaza et al., 2024).

Chatbots or intelligent agents enhance search engine performance by extracting attributes like keywords and document formats from text. These attributes' relationships are then established and visualized using a new hypertext paradigm based on Zig Zag principle which emphasizes a strategic approach to achieving objectives by flexibility and ingenuity (Mirjana et al., 2005). Learning experience of students can be enhanced in multiple ways (Surapaneni, 2024): (i) personalization, by analysing students, teachers and researchers behaviour and preferences, AI delivering customized content and recommendations and ensuring more relevant and engaging interactions, (ii) predictive interfaces, through which AI anticipates user needs and dynamically adjusts interfaces in real time, boosting efficiency and satisfaction; (iii) intelligent agents support represented by AI-driven chatbots which offer instant, consistent, and in time support and (iv) automation, by addressing repetitive tasks within strategic and creative activities.

Methods of Integrating Technologies into Theoretical and Practical Activities in Higher Education

The integration of technology into teaching-learning-assessment activities to a considerable extent, in line with its pervasive influence in our daily lives, first and foremost requires an adaptation of traditional teaching methods to this reality. Consequently, this also implies the alignment of these methods, within teacher training programs, with disciplines that support computer-assisted learning (Borthwick & Hansen, 2017). Promoting a conceptual, organizational,

and methodological framework that facilitates the adoption of blended learning within each school subject would positively influence its presence in the field of education. On the other hand, familiarizing students with this working modality during their university years would ensure its integration into the activities of future teachers. While implementing the first perspective may be more challenging and long-term, incorporating examples of effective methodologies within university courses is much easier and more promising.

In the field of education, there is significant discussion about the impact of immersive learning on curiosity, interest, motivation, and student engagement in the educational process (Bidarra & Rusman, 2017). The realism and dynamism inherent in this learning approach require its combination with the traditional approach to theoretical courses, as there are multiple ways to leverage it, regardless of the subject matter.

On the other hand, in terms of practical activities, the organizational variants of these activities in line with the utilization of blended learning are numerous. Starting with the synchronous learning experiences established within theoretical courses, seminar activities can appeal to any of the "Online Driver" models (use of digital applications and platforms for learning), "Face-to-Face Driver" (used primarily for remedial or extension activities), or "Inside-Out Blended Learning" (continuing learning in external spaces, either physical or virtual). Another effective approach involves rethinking the structure of theoretical and practical activities through the adoption of the Flipped Classroom Model, Outside-In Blended Learning, or the Rotation Model.

AI Technologies' Role as Resources for Teaching and Learning

AI-based instructional technologies such as learning resources with key functionalities including learner profiling, learner autonomy, predictive modelling of learning trajectories, automated assessments, and adaptive learning techniques impact the learning process of university students by cultivating cognitive activation, self-directed learning and skills such as critical thinking and problem-solving (Chadha, 2024; Onat & Gülseçen, 2023). Creating favourable conditions in different educational contexts integrating artificial intelligence-based tools in the design of interactive and engaging activities and sequential learning tasks lead to increased motivation for learning and sustainable learning outcomes (Bennett & Abusaleem, 2024; Ramirez & Esparrell, 2024). In addition to the interactive role they play in students' learning journeys by providing timely assistance in situations where teachers, family or classmates are unavailable or lack the necessary skills, time and space limitations aside, AI tools such as intelligent tutoring systems, intelligent agents and conversational robots integrated into teaching and learning collaborative environment by teachers too, offer the advantage of saving time while enhancing efficiency and personalization in the learning process (Onat & Gülseçen, 2023; Ramirez &

Esparrell, 2024; Gocmez & Okur, 2022). In the academic environment of higher education, an intelligent agent can make a significant contribution by performing various tasks, from reducing repetitive activities to facilitating understanding and learning through one's own experience creating a framework for facilitating interactions between students and providing mutual feedback, transforming education into a collaborative process of knowledge building (Ramirez & Esparrell, 2024).

The adoption of AI technologies in higher education emphasizes the significant role of AI developers in the dynamic ecosystem created: (i) to better understand AI and its application in education, (ii) to develop interdisciplinary collaboration among stakeholders such as researchers, AI developers, teachers and students, (iii) to improve access to knowledge, (iv) to better comprehend and forecast learning based on learning behaviours and strategies in instructional processes for transformation and challenges in new pedagogical scenarios, (v) 'to anticipate, adapt, and actively seek ways to support students', (vi) to design and develop personalized educational routes to meet the individual needs of learners and (vii) to ensure efficient and equitable solutions for sustainable and quality education and training using AI (Ramirez & Esparrell, 2024:36; Park & Doo, 2024; Mangera, Supratno & Suyatno, 2023; Tapalova & Zhiyenbayeva, 2022).

AI Tools in Foreign Language Teaching

In this part of the research, we are interested in AI tools that can be used for scripting, to understand the mechanisms of creating and adjusting prompts for educational purposes. We start from the following question: prompting is (not) an art? We want to show how we can use ChatGPT effectively, to make our work easier and keep up with technological changes. The prompts must be adapted to specific educational objectives (grammar, vocabulary, conversation), by specifying the CECRL levels, the targeted structures and the cultural context: "With the help of various machine learning algorithms, AI can identify the patterns in a dataset and performing predictive tasks without any need to explicitly programme a computer for that specific task" (Churi, 2022: 96). For example, in foreign language teaching, in the 6th, *Building blocks of communication*, we have topic like: *Expressing habits, routines vs. temporary actions, annoying habits, making plans –The present*. The teacher can ask ChatGPT to generate a request so one can check the targeted content: Generate a dialogue in English between two friends who want to go to the cinema. Include at least 5 verbs in the present tense and 5 cardinal numerals! The generated result can be observed below.

Dialogue: Going to the Cinema

Sophia: Hey, Liam! Do you want to go to the cinema today?

Liam: Yes, I really like watching movies! What time does the movie start?

Sophia: It starts at four o'clock. We can meet at three thirty in front of the cinema.

Liam: Sounds good! How much is the ticket?

Sophia: It costs twelve dollars. I only have five dollars with me.

Liam: No problem, I have twenty dollars. I can help you!

Sophia: Thank you! I buy the tickets, and you buy the popcorn?

Liam: Sure! I always eat popcorn when I watch a movie.

Sophia: Me too! Let's go and have fun!

Liam: Yes! See you soon!

Source: ChatGPT, Personal communication, March 24, 2025

We note that the dialogue is simple (A1), because we did not specify the language level. The request may be repeated for a B1 level task too.

Dialogue: A Trip to the Cinema

Lucy: Hey, Tom! Do you want to go to the cinema tonight?

Tom: Yes, I love going to the cinema! What movie do you want to watch?

Lucy: There is a new comedy. It starts at eight o'clock.

Tom: That sounds good! What time do we meet?

Lucy: Let's meet at seven fifteen in front of the cinema.

Tom: Perfect! How much is the ticket?

Lucy: It costs twelve dollars. I can also buy some popcorn!

Tom: Yes, I have twenty dollars. I can also buy some popcorn!

Lucy: Great! I always eat popcorn when I watch a movie.

Tom: Me too! We arrive at seven fifteen, buy our tickets and enjoy the film!

Source: ChatGPT, Personal communication, March 24, 2025

We notice that, although the linguistic levels are different, the generated result cannot prove the same thing. On the contrary, the dialogues seem very similar. Therefore, we will identify a limit of AI here, because the nature of the input is very important. The teacher must structure the

content to cover production, understanding, and reflection, favouring an interactive approach. "There is several upstream processing steps required to transform the text, whether it is what you type or the training data, into the actual model input. The initial step in this process is known as tokenisation. Tokenisation involves breaking the text into tokens" (Chan & Colloton, 2024:189). And this is where the importance of a well-formulated consign comes in, because a vague prompt will lead to imprecise answers. Furthermore, a clear instruction with plenty of details will generate targeted responses. The more relevant details our query contains, the more the AI will understand our intention.

The tokenisation approach may require different strategies for different languages. For example, for the same instruction, but in French this time, ChatGPT us the following version:

Lucas : Salut, Emma ! Ça te dit d'aller au cinéma ce soir ?

Emma : Salut, Lucas ! Oui, bonne idée ! Quel film veux-tu voir ?

Lucas : Il y a un nouveau film d'action qui passe à 20h. Sinon, une comédie commence à 18h30.

Emma : J'adore les comédies ! On y va pour 18h30 alors ?

Lucas : D'accord ! On achète les billets en ligne ou sur place ?

Emma : Achetons-les en ligne ! Comme ça, on est sûrs d'avoir de bonnes places.

Lucas : Bonne idée ! Les billets coûtent 12 euros chacun. Je prends aussi de pop-corn ?

Emma : Oui, un grand pop-corn et deux sodas. Ça fera environ 15 euros en plus.

Lucas : Parfait ! On se retrouve devant le cinéma à 18h !

Emma : Ça me va ! À tout à l'heure !

Source: ChatGPT, Personal communication, March 28, 2025

When the B1 level was added to the instruction, the vocabulary became more complicated, also containing fixed expressions, which was not the case for the English version.

Lucas: Salut, Emma! Rien de spécial. Pourquoi ?

Emma : J'ai envie d'aller au cinéma. Il y a un film qui sort aujourd'hui. Tu veux venir ?

Lucas : Oui ! Bonne idée ! Quel film veux-tu voir ?

Emma : Il y a l'Inconnu à Paris à 18 heures, Mission Extrême 5 à 20 heures, et une comédie à 21 heures 30.

Lucas : Hmmm...j'adore les films d'action. Mission Extrême 5 ça me tente bien !

Emma : Moi aussi ! Les critiques disent qu'il est super !

Lucas : Parfait ! On achète les billets en ligne ou sur place ?

Emma : Mieux vaut les acheter en ligne. Comme ça, on est sûrs d'avoir des places.

Lucas : D'accord. Combien coûtent les billets ?

Emma : Ils sont à 9 euros chacun. Si on prend du pop-corn, ça fait environ 15 euros en tout.

Lucas : Ça me va. Je réserve deux places tout de suite.

Emma : Génial ! On se retrouve devant le cinéma à 19 heures 45 minutes.

Lucas : Oui, à tout à l'heure !

Emma : À tout à l'heure !

Source: ChatGPT, Personal communication, March 28, 2025

"However, we predict that most institutions will fund and facilitate a broader approach towards the deeper integration of these technologies into programme curricula, though seeing the impact of this will take more time" (Chan & Colloton, 2024:248) The following AI engines have been used with our students: <https://chatgpt.com>, <https://chat.chatbotapp.ai/>, Grok, and <https://chat.mistral.ai/> to summarize academic papers, extract key concepts, establish connections between ideas and theories, and deepen researcher's understanding of how these theories apply to their work. In conclusion, "teachers and authors of educational material can use numerous possibilities for Web-based course offering and teleteaching, availability of authoring tools for developing Web-based courseware, and cheap and efficient storage and distribution of course materials, hyperlinks to suggested readings, digital libraries, and other sources of references relevant for the course" (Andric et al., 2005:25).

Another educational Chabot that my students use in language learning is Duolingo AI, an application which involved from automation to Artificial Intelligence Integration. In today's educational environment, the development of educational chatbots has fundamentally changed the way foreign languages are taught and learned and Duolingo AI is an intuitive app that enhances students' language learning for different levels of age and knowledge (Peláez-Sánchez & Velásquez-Durán, 2023). "Information and communication technology (ICT) has advanced because of the shift in educational tools and platforms from traditional approaches to technology-

driven programs such as Memrise, Babbel, HelloTalk and Duolingo" (Ouyang et al., 2024:98; Yunus et al., 2009). But here too, we find negative aspects, in that users (French speakers for example, they have only four options, not 16) need to already speak English to learn 16 languages, from French to Esperanto. We also do not have the option to learn the Latvian language. However, "Duolingo is one of the most popular and downloaded apps in the market, is promoted as a MALL app that helps users acquire the language by using communicative activities" (de Castro et al., 2016:60). This type of AI-integrated education represents a motivational boost, also contributing to the development of critical thinking of our students (Xu, 2025 apud Blanco, 2021).

A third chatbot that we propose to discuss in this article concerns an example included in the category of automatic conversational agents: it is ELIZA Chatbot, a program created in 1996 by MIT psychologist Joseph Weizenbaum. This program imitates human behaviour in a conversation, being used mainly in medical discussions, based on the text with a patient. "Being somewhat primitive, ELIZA cannot give a patient any insight but can guide his imagination towards it by asking some typical psychological questions" (Dokukina et al., 2020:543). We used this application in medical French classes, analysing the possibilities of quickly transmitting the message, adapting vocabulary specific to the medical context, but also the limits, in the sense that ELIZA cannot provide information regarding medical prognosis.

Discussion and Conclusions

The use of new technologies facilitates the work of teachers and students but does not exclude the involvement of the human factor in managing the teaching-learning process. Chatbots can be accessed 24 hours a day, 7 days a week, directly from the student's mobile phone. They are structured in such a way that learning can be done in small sequences, adapted to the needs of the learners, using recurring structures to fix concepts. Also, various AI programs are of great help to shy people who do not dare to practise their oral communicative skills in class, in front of their peers. However, these advantages cannot exclude the human presence in the teaching-learning-assessment process.

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